Jenny
Carol-ann
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COPY

SUPREME COURT OF THE STATE OF NEW YORK
COUNTY OF NEW YORK

PHYLLIS SMALL and DENISE FUBINI, individually, and on behalf of others similarly situated,

Plaintiffs,

- against -

LORILLARD TOBACCO COMPANY, INC., LORILLARD, INC., LOEWS CORPORATION, COUNCIL FOR TOBACCO RESEARCH-USA, INC. (Successor to Tobacco Industry Research Committee), AND TOBACCO INSTITUTE, INC.,

Defendants.

Index No. 110949/96

(Caption continues...)

Video Deposition of

PATRICK M. LIPPIELLO, Ph.D.

(Taken by Plaintiffs)

Winston-Salem, North Carolina

Friday, October 17, 1997

9:59 a.m.

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SUPREME COURT OF THE STATE OF NEW YORK
COUNTY OF NEW YORK

MARY ANN HOSKINS, Executrix of the Estate of Edwin Paul Hoskins, WALTINA BROWN and DANTE AUBAIN, individually, and on behalf of others similarly situated, Plaintiffs, - against - R.J. REYNOLDS TOBACCO COMPANY, RJR NABISCO, INC., COUNCIL FOR TOBACCO RESEARCH-USA, INC. (Successor to Tobacco Industry Research Committee), AND TOBACCO INSTITUTE, INC., Defendants.	Index No. 110951/96

SUPREME COURT OF THE STATE OF NEW YORK
COUNTY OF NEW YORK

SHARLENE HOBERMAN and AUDREY HULSE, as Executrix, on behalf of the Estate of Lewis Hulse, individually, and on behalf of others similarly situated, Plaintiffs, - against - BROWN & WILLIAMSON TOBACCO CORPORATION, B.A.T. INDUSTRIES P.L.C., BATUS, INC., BATUS HOLDINGS, INC., COUNCIL FOR TOBACCO RESEARCH-USA, INC. (Successor to Tobacco Industry Research Committee), AND TOBACCO INSTITUTE, INC. Defendants.	Index No. 110953/96

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SUPREME COURT OF THE STATE OF NEW YORK
COUNTY OF NEW YORK

ROSE FROSINA, ELIZABETH COLAVITO and ANILDA ROSS, individually, and on behalf of others similarly situated, Plaintiffs, - against - PHILIP MORRIS, INC., PHILIP MORRIS COMPANIES, INC., COUNCIL FOR TOBACCO RESEARCH-USA, INC. (Successor to Tobacco Industry Research Committee) AND TOBACCO INSTITUTE, INC., Defendants.	)	Index No. 110950/96

SUPREME COURT OF THE ESTATE OF NEW YORK
COUNTY OF NEW YORK

CATHERINE ZITO, PETER HOBERMAN, and GEORGE ELISSEOU, individually, and on behalf of others similarly situated, Plaintiffs, - against - THE AMERICAN TOBACCO COMPANY, INC., AMERICAN BRANDS, INC., COUNCIL FOR TOBACCO RESEARCH-USA, INC. (Successor to Tobacco Industry Research Committee), AND TOBACCO INSTITUTE, INC., Defendants.	)	Index No. 110952/96

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(202) 879-3939

ALSO PRESENT:

John Girdler, Videographer

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P R O C E E D I N G S

VIDEOGRAPHER: We're going on the record. The time is 9:59 a.m. This is the videotape deposition of Pat Lippiello, Ph.D., in the matter of Mary Ann Hoskins, et al., Plaintiffs, against R.J. Reynolds Tobacco Company, Defendants, index number 110951/96 and related cases, under the jurisdiction of the Supreme Court of the State of New York, County of New York.

This deposition is being held at the offices of Womble Carlyle Sandridge & Rice, 200 West Second Street, Winston-Salem, North Carolina on Friday, October 17th, 1997.

My name is John Girdler; I'm the video specialist. The court reporter is Linda Russell. We are here in association with Nationwide Court Reporters, with offices located at 45 Rockefeller, New York, New York.

Counsel will now state their appearances for the record and the court reporter will swear in the witness.

MR. PLASSE: Jonathan Plasse of Goodkind Labaton Rudoff and Sucharow, for plaintiffs.

MS. FEE: Denise Fee, Jones Day

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Reavis and Pogue, for Defendant R.J. Reynolds Tobacco Company.

PATRICK M. LIPPIELLO, Ph.D.,

having been first duly sworn, was examined and did testify as follows:

EXAMINATION

BY MR. PLASSE:

Q. Could you state your full name for the record, please.

A. Patrick Michael Lippiello.

Q. Where do you currently reside?

A. [DELETED]

Q. Is it Dr. Lippiello?

A. Yes.

Q. Are you currently employed?

A. Yes.

Q. By whom?

A. By R.J. Reynolds Tobacco Company.

Q. Have you ever been deposed, before today, in any litigation?

A. Yes, I have.

Q. How many times?

A. Once.

Q. Which litigation?

A. The Arch case.

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Q. Okay. Was that -- when was that deposition taken?
A. Several months ago. I can't recall exactly.
Q. Did that occur on two different days?
A. I believe it did. Yes.
Q. Other than that, you've never testified -- you've never been deposed in any other proceeding; is that correct?
A. No.
Q. Have you ever appeared as a witness at trial?
A. No.
Q. Have you ever been subpoenaed before a grand jury?
A. No.
Q. Have you ever been requested to produce documents before a grand jury?
A. No.
Q. I've had the benefit of reviewing your testimony at the -- in the Arch -- Arch litigation, so perhaps I will go through this a bit quickly, rather than repeat what's already there.
. You attended college starting in 1968?
A. Yes.
Q. At RPI, Rensselaer Polytechnic Institute?
A. Yes.

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Q. And you graduated in 1972?
A. Correct.
Q. You received a bachelor of science from that university?
A. Yes.
Q. Did you then take postgraduate courses?
A. Yes.
Q. Was that in preparation for going to medical school?
A. Well, at the time, it was medical school, and then wound up going to graduate school in biochemistry.
Q. Okay. Over what period of time did you take those postgraduate courses?
A. '73.
Q. At some time thereafter did you join the Army?
A. I was -- I joined the National Guard.
Q. Okay. When was that?
A. Let's see. That would have been July -- around about July of '72.
Q. Okay. Were you in the National Guard for six years?
A. Yes.
Q. And did you have any service in the army in

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addition to the National Guard?
A. Well, you're required to be on active duty for several months' training at the very beginning.
Q. Was that sometime in 1972, then, that you were --
A. It was -- no, actually they allowed me to finish out some work that I was doing, and then I started in January of '73 and got out in May of '73.
Q. Did there come a time when you determined not to go to medical school?
A. Yes.
Q. When was that? 1973?
A. 1973.
Q. What were the reasons for that?
A. I wasn't accepted. Actually, what happened was I was in the -- while I was on active duty, I had several interviews, which obviously I couldn't get out of active duty for, so the opportunity went by.
Q. So you decided, instead, to seek to obtain a Ph.D.?
A. Yes.
Q. And you attended the University of Virginia?
A. Correct.

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Q. From 19 -- starting 1974?
A. Yes.
Q. When did you obtain your Ph.D.?
A. In '79.
Q. And you obtained a Ph.D. in biochemistry?
A. Correct.
Q. Were you going to the University of Virginia on a full-time basis?
A. Yes.
Q. While you were attending University of Virginia, were you employed?
A. Well, graduate students, at that time, received a stipend. So you --
Q. Okay. Were you employed anywhere other than in connection with the university?
A. No. Well, the National Guard, of course, you had your monthly; you get paid for that.
Q. So you received your Ph.D. from the University of Virginia in 1979, right?
A. Right.
Q. And then you -- let's see. You got a postdoctoral fellowship --
A. Correct.
Q. -- is that correct?
And that was at the -- is it Bowman or

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Bowman?

A. Bowman. Bowman Gray School of Medicine.

Q. Bowman Gray School of Medicine? Okay.

And that fellowship lasted through 1982?

A. That's correct.

Q. Okay. And what did you do at Bowman during that fellowship?

A. Let's see. I worked with Dr. Mosley Waite, who was the chairman, and continues to be the chairman of the biochemistry department. And I was in his laboratory as a postdoctoral fellow, working in the area of lipoproteins. Lipoprotein metabolism.

Q. Can you define what "biochemistry" is. Your understanding.

A. It's the study of the basic chemical properties of biological systems and molecules.

Q. Let's see. When you finished the fellowship at Bowman, did you then become employed at RJR?

A. Yes.

Q. That was in 1982?

A. Correct.

Q. And your first position at RJR was a senior at research and development?

A. Senior R & D scientist, yes.

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Q. And how long did you serve as a senior R & D scientist?
A. It was maybe four, five years.
Q. Okay. Generally, what did you do as a senior R & D scientist?
A. I did basic studies on nicotinic cholinergic receptors.
Q. Nicotinic?
A. Cholinergic --
MR. PLASSE: Do you have the spelling on that?
COURT REPORTER: Uh-huh.
THE WITNESS: -- receptors.
BY MR. PLASSE:
Q. I'm a little unclear, based -- from your testimony in Arch. What happened after -- did your position change in or around 1987 or 1988 at RJR?
A. I received a promotion to senior staff level.
Q. Okay. Same group?
A. Yeah, I believe it was still the same group at that point.
Q. Okay. Did you have any increased responsibilities at -- in that position?
A. Just basically to, you know, increase the scope of the research a little bit. I think we may

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have gotten another technician involved at that point, something along those lines.

Q. How long did you hold that position?

A. Until '90.

Q. What position did you assume in 1990?

A. Master scientist.

Q. Same division?

A. By that time I was part of a different division.

Q. What was the name of that division?

A. It was the biochemical/biobehavioral division, I believe it was called at that time. And, actually, I was in a group that was under that.

Q. What was the name of that group?

A. Pharmacology.

Q. And how long did you stay as a master scientist?

A. I still hold that position.

Q. Did the division change since 1990?

A. Yes. I took over responsibilities for pharmacology a few years ago.

Q. Okay. When was that?

A. I can't remember the exact year. Maybe three years ago, something like that.

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Q. In around 1993, 1994?
A. Right around there, yeah.
Q. What's your precise title at this point?
A. Master scientist, section head.
Q. Of the pharmacology group?
A. Pharmacology division.
Q. The pharmacology division is a division of which group at this point?
A. Product evaluation.
Q. So, at a certain point, the pharmacology division disentangled itself from the biochemical/behavior (sic) division; is that correct?
A. No, it still -- the names changed, but the people are still there; the same, basically.
Q. When you served as a master scientist at the biochemical/behavior beginning in 1990, who did you report to?
A. Let's see. The last person I reported to before moving to pharm -- did you say pharmacology or biochemical?
Q. 1990 pharmacology, yeah.
A. In pharmacology I reported to Don deBethizy.
Q. And before that, when you were the senior -- I guess, what was it, senior scientist?

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A. Yeah. Dr. John Reynolds at that time.
Q. How long -- during what period of time did you report to Dr. Reynolds?
A. During the '80s, primarily.
Q. 1982 to 1990?
A. Yes. Yes.
Q. And currently, in your present position, master scientist/section head, who do you report to?
A. Don deBethizy.
Q. Did you ever report to a Mr. Wally Hayes?
A. Not directly, no.
Q. Okay. Did you report to someone who reported to him?
A. Yes. Don deBethizy.
Q. Over -- during what time was that? Well, let me rephrase that.
What position did Mr. Hayes have during the time that you were referring to?
A. He was vice president, head of the biochemical/biobehavioral group.
Q. Okay. And over what period of time has he held that position?
A. He's no longer with the company. So he held it from -- well, let's see. He arrived circa 1984

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or '5, and began as -- at the director level, was promoted to VP. And I'm not sure exactly what year Dr. Hayes left. It was early '90s.

Q. Did you ever make any written or oral presentations to Dr. Hayes?

A. Very few, that I can recall. We had informal conversations.

Q. But in terms of a formal presentation, written or oral, you did do that on some occasions?

A. Maybe once or twice a year.

Q. What was the occasions? Was there a particular occasion, I'm sorry, when you made the presentations --

A. No, they were kind of impromptu. You know, just every once in a while he would like an update on specific areas of research, and -- and we would accommodate him.

Q. I'm going to mispronounce it. Your basic area was in nicotine cholegenic (phonetics) receptors; is that correct?

A. Cholin -- cholin -- now you got me saying it. Cholinergic receptors.

Q. And is that what you made presentations to Mr. Hayes about, if you recall?

A. Yes.

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Q. Was Mr. Robinson involved in any of the divisions that you were affiliated with?
A. Yes.
Q. What was your relationship to him, if any?
A. We were in the same division, the biobehavioral division, during the time when we reported to Dr. Reynolds.
Q. How about Dave Gilbert? Were you affiliated with him in any way?
A. He was also part of that division.
Q. Do you have an understanding of the term pharmacology?
A. Basically.
Q. What's that? What is your understanding?
A. It's the -- the interaction of -- well, it can be broad or narrow, depending on how you want to define it. The interaction of chemicals -- biochemicals with biological systems, in the broadest sense, and what physiological or other effects, biological effects, result from that.
Q. Ever hear of Mr. Andrew Bane, B-A-N-E?
A. Yes.
Q. Have you had any relationship with him at RJR?
A. Andrew Bane was a postdoctoral fellow in the

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pharmacology group or division. Worked in my laboratory.
Q. So he reported to you or was under your supervision?
A. Yes. Yes. Well, it was kind of a split supervision between myself and Dr. Bencherif, who is closer to the laboratory now than I am. So -- so they worked very closely together.
Q. What general areas was Mr. Bane involved with? Research areas.
A. He was involved in setting up various animal behavioral testing.
Q. Okay. Does it have to do with the effects of nicotine on animal behavior?
A. Partly, yes.
Q. Well, did he do any papers or reports which he derived from his research?
A. He has actually left the division for a position in Colorado now, so he didn't have time to write up his results.
Q. During what period of time was he at the pharmacology division?
A. Let's see. He started out in July of '96 and he left in Aug -- around August -- the end of August or September time -- I guess September time

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frame.
Q. Of this year?
A. This year, yes.
Q. How about Eric F-L-U-H-L-E-R?
A. Eric Fluhler.
Q. Okay. Have you worked with him at RJR?
A. Yes.
Q. What division was he in?
A. He was part of the pharmacology division. And he reported to me.
Q. What period of time was he employed at the pharmacology division?
A. Early '90s. He wasn't there very -- more than about three years, as I recall.
Q. What areas of research was he involved with?
A. He did a lot of very basic research on using cell culture approaches to study nicotinic receptors.
Q. Do you do the -- were you involved in some of the same type of work, using cell cultures to study nicotinic receptors?
A. Initially, yes. Until I got into a more supervisory role.
Q. Did -- is it Dr. Fluhler?
A. Yes.

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Q. Did he prepare any reports while he was at RJR, that you're aware of?
A. I believe he did, yes.
Q. Did he make any presentations to you?
A. Very rarely formal presentations. More often lab meetings and informal conversation.
Q. What specific areas was he studying with respect to cell -- cell cultures and nicotinic, I'll mispronounce it, receptors?
A. Part of what he was doing was trying to understand how the receptors actually function.
Q. Did he come up with any theories about that?
A. I guess one of the approaches that he was following up on was trying to understand the types of ions that flow through the -- the channel of the receptor when it opens and closes.
Q. I guess we'll get into this in a bit more detail later on. But, in general, the -- is it fair to say that the receptor responds to nicotine?
A. Fair to say what?
Q. What -- well, what does the receptor respond to?
A. Anything that resembles acetylcholine.
Q. Does it respond to nicotine?
A. Some of the receptors -- well, I guess most

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of the receptors do, yes.

Q. Okay. And then is one of the responses -- I guess you referred to it earlier before, this is what ions are --

A. Ions flow through --

Q. Flow through?

A. -- a channel in the middle of the receptor, yes.

Q. And where do the ions go?

A. Into the cell.

Q. Okay. So was Dr. Fluher (sic) --

A. Fluhler.

Q. -- focussing on that limited aspect of the flow of ions in response to the receptor being triggered?

A. Yes. He was -- he was developing methods -- fluorescence methods to -- to actually visualize those responses under a microscope.

Q. Okay. And did his report or was -- I guess -- I think you referred to he may have done a report. Did that relate to that particular aspect, the studying of -- I'm sorry, tracing the ions as they're -- is it "discharged"? What's the verb?

A. Flux. Flux of ions --

Q. Flux. All right.

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A. -- is typically --
Q. That was what his report related to, the flux of ions?
A. He reported -- he had a chapter that he put together for a book that -- that I edited, on the biology of nicotine. So, yes, he did report that. It was published.
Q. Do you know David, I'll mispronounce his name as well, Plowchalk?
A. Yes.
Q. Is that P-L-O-W-C-H-A-L-K?
A. Correct.
Q. Did he work in the pharmacology division while you were there?
A. Yes.
Q. What period of time?
A. It was also right around the time that Don deBethizy first took over that division; I can't remember exactly what year. But he was Don's postdoctoral fellow at that time.
Q. Okay. Did he work on any -- Mr. -- is it Dr. Plowchalk?
A. Yes.
Q. Did he work in a particular -- in any particular areas?

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A. He was -- again, I'm not completely familiar with his work, since he was working with Dr. deBethizy primarily. But the general area that he was working in was pharmacokinetics and metabolism.

Q. How much time did you spend in pharmacokinetics? Not much?

A. No. No, that wasn't my area.

Q. Just in general, what is pharmacokinetics, if you know?

A. Looking at the -- the levels of -- of various compounds in blood, the levels and how long they last, I guess would probably be the easiest way to put it.

Q. And was one of those compounds nicotine, that was --

A. Correct.

Q. Did a Mr. Mel Anderson work in the pharmacology division?

A. No.

Q. Do you remember --

A. He was -- I believe he was a university professor that consulted on some of those projects. I did not --

Q. Which projects?

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A. The pharmacokinetics and metabolism.
Q. Well, which university is -- was he affiliated with?
A. Now you're taxing my memory again. I -- I didn't deal with that part of it very much, so I'm not sure.
Q. During the time you've been at RJR, did you prepare periodic reports for review by your superiors?
A. Yes.
Q. Over what period of time did you prepare periodic reports?
A. From '82 until the early '90s, I guess.
Q. Why did you stop preparing the periodic reports?
A. At that point we were publishing virtually everything, so there was -- rather than duplicate everything with internal reports, we just published it in the peer review literature. So, in a sense, the reports continued, but they were just in a different form.
Q. Who were the periodic reports disseminated to?
A. There was usually a distribution list at the end of those reports, but that changed over time.

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Typically, management people.
Q. How high up in management? Mr. Johnston get them?
A. No, I don't believe so. I think --
Q. Mr. Hayes?
A. Dr. Hayes would have gotten them, yes. And -- and potentially the head of R & D, from time to time.
Q. Were these reports prepared quarterly?
A. That was another thing that varied over time. At one time it was weekly; then it was monthly, quarterly. And it went back and forth, depending on management swims. But -- and need for information. But it varied.
Q. And what, in general, did you include in your periodic reports?
A. Usually, just a summary of the -- the data that we'd obtained over that period of time, whatever it happened to be.
Q. Did most or all of your periodic reports relate to your studies and research regarding nicotine cholinergic receptors?
A. That's correct.
Q. Do you recall any other areas of research that were referred to in your reports?

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A. No. That was exclusively what we worked on.
Q. Did there come a time when you started giving oral reports, after you stopped preparing the periodic written reports, to various members of management?
A. Usually just to -- to our direct supervisor. In this case, Dr. deBethizy.
Q. At any time after you stopped preparing the periodic reports, in around 1990, did you provide any oral reports to Dr. Hayes of what you were doing?
A. Infrequent -- very infrequently.
Q. What would the occasion be that you would provide such reports to Dr. Hayes?
A. If there was an interesting research finding, for example, he might want to know more about.
Q. Have you ever met Mr. Johnston?
A. Yes.
Q. How many times?
A. Maybe twice.
Q. Do you recall the circumstances of the first time you met him?
A. It was -- I think on both occasions it was when all the management team was gathered together to hear a presentation by him. I think -- there

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may have been one other occasion when we completed our project leadership training program, then I think he came around and shook hands with everybody, but --

Q. When was that?

A. -- there wasn't really much conversation involved.

Q. When was that? That was early on in your career?

A. Yeah. It was -- that would have been around nine -- well, early '90s, I guess.

Q. You indicated that he -- Mr. Johnston may have made a presentation to management on one or two occasions?

A. Yeah. Basically state of the business type presentations.

Q. Do you know when that happened or on what times --

A. No, I really can't recall. It's been many years.

Q. -- that happened?

Sometimes during the 1990s?

A. Yes.

Q. Do you recall generally the substance of his presentation, what areas were covered?

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A. Lots of things that I knew very little about, understood very little: Market share and those sorts of things.
Q. Do you recall what he said about market share?
A. Not specifically, no. I mean, it was specific to the time.
Q. Right. Did you under -- do you recall whether he indicated there was any declining market share of RJR products?
A. I know often the emphasis was on declining market share for the industry, in general.
Q. At -- well, is your present recollection there was one, maybe two, such presentations by Mr. Johnston? Is that fair to say?
A. That I attended, yeah.
Q. Okay. Do you recall whether at that presentation or presentations whether he addressed the issue of how the company should respond to the declining market share of cigarette sales?
A. Not specifically. Other than to make better products.
Q. Okay. Did he discuss how to make better products?
A. No. No, they -- they never got into that

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level of detail. It was really more of -- along the lines of a pep talk, you know, asking for a lot of people to get out there and try to do their best to compete.

Q. Do you recall whether Mr. Johnston referred to Premiere or Eclipse projects at any of those presentations?

A. No, I don't recall him ever talking about those.

Q. Do you recall whether Mr. Johnston referred to manufacturing and selling cigarettes that would have a lesser tar content than previously?

A. No.

Q. Did you have periodic meetings, during the time -- during the time that you've been employed at RJR, with your colleagues?

A. Just periodic scientific meetings or --

Q. Well, fine. Periodic scientific meetings?

A. Yes.

Q. How frequently would you have such meetings? Did it vary over the time that you've been at RJR?

A. You're talking about the people that I worked with directly in the laboratory?

Q. Right.

A. Typically, once every week or two we would

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have lab meetings.
Q. What would be the subject of discussion at those meetings?
A. Primarily presenting data, trying to understand what the results meant; those sorts of things.
Q. So that would -- that would include which groups of individuals? Just people working on your particular area --
A. Yes.
Q. -- or other areas as well?
A. My area.
Q. Did you have meetings with other members of the pharmacology department, where there would be a discussion of different research projects that were being conducted at that time, on a periodic basis?
A. During which time? Because it --
Q. Any time.
A. Initially, when I was reporting to Dr. deBethizy, we would have discussions about some of the other projects, yes. That's why I learned a little bit about the pharmacokinetics, but only in a -- a very general way.
Q. Okay. And after that, were there such meetings were there'd be different projects

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discussed by different people at pharmacology?

A. Depending on, you know, who had -- had any interesting data to talk about.

Q. Let me ask you: In general, you've referred to the pharmacokinetic area and you referred to nicotine cholinergic research. What other areas were being considered while you've been at RJR in your group or groups?

MS. FEE: Object to the form.

THE WITNESS: I mean, that's such a broad question. I mean, can you be more specific?

MR. PLASSE: Okay.

BY MR. PLASSE:

Q. Within the pharmacology division --

A. Okay.

Q. -- which areas of -- general areas of research were being conducted, other than the pharmacokinetic and nicotine cholinergic areas?

A. The only other one that I can recall is there was a couple of people in the group responsible for doing skin painting studies with tar.

Q. Who was in charge of that, if you know?

A. They both reported to people -- all reported to Dr. deBethizy at the time. Because we were all in the same division.

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Q. During what period of time was the pharmacokinetic research done at -- within the pharmacology division? All the time that you've been there?

A. Yes, primarily. Although initially it was some animal research to define some of the parameters. And then, after a while, it became computer based. Modeling.

Q. In terms of resources, are you able to say whether there was more resources spent in your area as opposed to the pharmacokinetic area?

A. I really don't know how it was broken down, to tell you the truth. I presume it was equally distributed across all the projects.

Q. So you never made a presentation to Mr. Johnston; is that -- is that correct?

A. That's correct.

Q. Do you know who David I-S-B-I-S-T-E-R is? Isbister?

A. Yes, he was -- he was fairly high up in management at one point. I can't remember his exact title. One -- one of the vice presidents.

Q. Do you ever speak to him?

A. No.

Q. Ever make any presentations to him?

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A. No.
Q. Do you know Mr. G. R. DiMarco?
A. Yes.
Q. Is he a member of management?
A. Yes.
Q. Do you know what his position was or title?
A. He was, I believe, senior VP, and head of research and development for several years.
Q. While you were in the pharmacology division?
A. I think there may have been a little bit of an overlap, yes.
Q. Did you have occasion to speak to Mr. DiMarco?
A. Occasionally. He was a very busy man.
Q. Did you ever make any presentations to him?
A. Maybe once or twice.
Q. On your --
A. On -- just -- he had an interest in -- in the basic research of nicotine. So, maybe, on a couple of occasions, we updated him on the receptor work.
Q. It would be much easier for me if we refer to it as "receptor work".
So you think maybe on one or two occasions you gave Mr. DiMarco an update on -- on the receptor work that you were working on?

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A. Yes.
Q. Do you know Mr. David I-A-U-C-O?
A. I'm familiar with who he is. I know what he looks like, but I've never met him.
Q. Do you know what his position was or is?
A. Again, I don't know his exact title, but he's fairly high up in the executive management team.
Q. Okay. How about Mr. William Holdebolt, H-O-L-D-E-B-O-L-T?
A. I think it's H-I-L, Hildebolt.
Q. Okay.
A. Yeah, he was --
Q. Ever meet him?
A. Yes. He was part of research and development, one of the directors at one time.
Q. Okay. You ever make any presentations to him?
A. No.
Q. You met him?
A. Yes.
Q. Ever discuss your receptor work with him?
A. No.
Q. Now, you prepared certain reports and studies in connection with your receptor work; is that correct?

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A. That's correct.
Q. With respect to those -- well, I guess -- and some of those have been published, your studies?
A. (Witness nods head.)
Q. Okay.
A. Yes.
Q. Was there a procedure that was followed with respect to the preparation of those reports in terms of how they were prepared internally at RJR and reviewed internally at RJR?
A. Typically we would prepare a draft of the paper, get it into a form we thought would be suitable for publication, and then it would go through the PPRC, the presentation and publication review committee, which was basically a peer review committee.
Q. Was that at R & D?
A. Yes.
Q. Okay. Anything else in terms of procedure?
A. It had to go -- it had to pass through that committee before we would submit it for publication. They were primarily -- the primary purpose of that committee was to make sure that the science was sound before we submitted it for publication.

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Q. Any lawyers, either in-house or outside, review the research reports/studies before they were printed, published?

A. Typically, there would be a representative of legal on the PPRC.

Q. Okay. Can you identify any of those individuals by name?

A. Let's see. I guess it's primarily Gus Borschke.

Q. B-O-R-S-K-Y?

A. S-C-H-K-E.

And he's a patent attorney, so he would -- he would review the material to make sure that we weren't giving up anything that was potentially patentable.

Q. Do you recall any situation where Mr. Borschke edited or revised any of your research reports or studies?

A. No. Other than you left a period out or spelled something wrong.

Q. Who did Mr. Borschke report to? Do you know?

A. He reports to Chuck -- Charles Blixt, I believe.

Q. What was Mr. Blixt's position?

A. He's chief counsel.

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Q. Did you ever have any discussion with Mr. Borschke about any of your work?

A. Yes.

Q. On more than one occasion?

A. Yes.

Q. What was the general subject matter of the conversations you had with Mr. Borschke?

A. It was related to some of the work that we were doing that was potentially patentable.

Q. You ever speak to Mr. Borschke about any pending or potential litigation?

A. Very rarely.

Q. At all?

A. No. Most -- almost all of our conversations are related to -- other than friendly conversations, are related, business-wise, to the -- to the patent position that we're trying to establish on various things.

Q. Did Mr. Borschke review other individuals' reports or studies in conjunction with his -- well, was he a member of the PPRC?

A. Yeah. The PPRC has become less formal. I mean, the process still occurs, but it's not called that anymore. And so he is, yes, in the chain of reviewers.

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Q. So he's reviewed other individuals' reports and studies, prior to publication?
A. That's the typical procedure, yes. I would presume so.
Q. Do you recall any employee of RJR telling you that their report or study had been modified by Mr. Borschke or any other lawyer at RJR?
A. No.
Q. So you think Mr. Borschke may have changed some periods or grammar here and there in some of your reports?
A. Yeah. That's pretty much the --
Q. Do you recall anything else he did? Ever ask you to change a word?
A. Other than -- other than pointing out, you know, this -- certain things could be patentable. I mean, that's primarily what his focus is.
Q. Did you know that Mr. Johnston appeared before Congress in 1994 to discuss various matters relating to cigarettes?
A. Yes, I am aware of that.
Q. Did you attend any meetings, prior to the time that Mr. Johnston appeared before that hearing, with respect to what his testimony or positions would be?

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A. No.
Q. Ever speak to Mr. -- Dr. Robinson about what Mr. Johnston might say before Congress or did say before Congress?
A. No.
Q. How did it come about that you became involved with receptor work at RJR?
A. It was -- it was an area that I'd always been interested in. And when I first joined the company, I had some discussions with Dr. Morse, I guess, primarily, and Dr. DiMarco, who'd just come on board. And they were asking me at that time what a biochemist could study that would be of interest. And so I was pretty much given free rein to search the literature and come up with a proposed program. And that seemed an obvious area.
Q. So before you started at RJR, there wasn't any receptor work being done, that you were aware of?
A. No.
Q. And why did you think it was an obvious area, receptor work?
A. Well, I mean, nicotine, obviously, is a -- is a component of the product. And I had been aware from the literature of nicotinic cholinergic

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receptors, which had been studied for -- well, for a hundred years, really. And -- however, you know, it was -- it was still an emerging area, because the tools weren't there yet to -- that we needed to be able to understand them completely. So, as a basic research approach, I thought that would be a nice place to start.

Q. When you started your work at RJR on receptors, can you tell me generally what was known about receptors? In general terms.

A. About receptors or about nicotinic receptors?

Q. Nicotinic receptors.

A. Well, as I say, they -- they had known about -- I mean, nicotine was really the molecule used to define, back in the 1890s, the so-called receptive substance. You know, the whole concept of receptors. And then, over the decades, they became more familiar with this -- what's now known as a classical nicotinic receptor, the one at the neuromuscular junction. And that's probably -- at that point, had been the most widely studied.

Q. Where is that receptor located?

A. It's on the muscle tissue, postsynaptic to the nerves that innervate the muscle.

Q. What part of the body?

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A. Skeletal muscle. All skeletal muscle contains those receptors.

Q. When you started your work, what was known, if anything, about how nicotine affected the receptors?

A. Again, it was -- it had been used for decades, just as a probe, to study the receptors. It appeared to interact with the receptors in the same way as all other so-called nicotinic agonists, including acetylcholine.

MR. PLASSE: Are you getting this?

COURT REPORTER: Yeah. I've heard it before.

BY MR. PLASSE:

Q. And when you started your work, did you have an idea generally what areas you wanted to pursue, to develop?

A. Very generally.

Q. What were those.

A. Just -- I guess the focus, at first, was to understand more about the -- you know, just the basic properties of the receptors, which hadn't been defined yet, in tissue: How many there are, the binding properties, those sorts of things.

Q. Okay. What else?

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A. Then, of course, from there, the natural progression was to under -- begin to understand more about how they functioned.
Q. When you say "how they functioned," you mean what happened after they reacted to the -- the nicotine?
A. Or to any compound, yeah, of interest.
Q. Nicotinic receptors are located throughout the body?
A. That's correct.
Q. There's some located in the brain?
A. Correct.
Q. There's some located in -- I guess you refer to as the gut, the stomach, gastrointestinal area?
A. Yes.
Q. Where else?
A. In the ganglia.
Q. Okay. Where are the ganglia located?
A. Those are the -- the nerves that project to various tissues in the -- organs in the body. And so there are synapses in the tissue, and then there are synapses kind of between the tissue and the spinal cord, and those are ganglionic.
Q. Okay. Anywhere else?
A. Those are the primary -- the muscle, the

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ganglion, the central nervous system, I guess those are the primary areas of -- that people have studied.

Q. Okay. And when you started your work, how did you envision doing the research? Were you going to be working with tissue? Were you going to be working with human -- humans? How were you going to do it?

A. It had to be -- I mean, because of the -- the lack of knowledge, it had to be, at least initially, with the tissue preparations.

Q. And tissue of rats, mice?

A. Rats.

Q. Okay. And so you would do this work -- or you did do the work at RJR, using animal tissue of rats?

A. Yes.

Q. Is work done on receptors still -- is work on -- at RJR, today still done on the subject of receptors by using animal tissues of rats?

A. Yes.

Q. Anything else?

A. Cell culture.

Q. Could you describe what you mean by "cell culture".

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A. Basically, you dissociate the tissue of interest into individual cells, and then you put those cells on a Petree dish, and they'll stay for a period of time before they naturally die out. But you can maintain them for a period of time and study them.

Q. And these are cells of what organism?

A. The rat. And we have -- well, we have one cell line that's of human muscle origin.

Q. When did you start with that?

A. About three or four years -- four years ago.

Q. Have you been pursuing any avenue of research with respect to that particular cell culture?

A. We use that along with all the other tissues and cell cultures that -- that we have, to -- to study the properties of all the different receptor subtypes.

Q. As a result of your work, are you generally familiar with what effects nicotine has on the body?

A. Not so much a result of our work as much -- I mean, in terms of whole animal work, which is primarily done in -- in ex-house laboratories. It's only been recently that we have started up some in-house behavioral studies. So I would say

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our understanding is increasing at the molecular level.

Q. And I guess, as a result of your work, you are familiar with nicotine's effect on the receptors, right --

A. Yes.

Q. -- located throughout the body?

A. Yes.

Q. Can you describe in general terms what nicotine's effect is on -- on the receptors?

A. The interaction is a binding interaction. It binds to the receptor protein. And then, as a result of that, the conformation of the protein changes and this ion channel opens and ions flow into the cell. At least that's the way we presently understand its workings.

MR. PLASSE: I'm sorry, could I have that read back, please.

(WHEREUPON, THE QUESTION WAS READ BACK BY THE COURT REPORTER AS FOLLOWS:

The interaction is a binding interaction. It binds to the receptor protein. And then as a result of that, the

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conformation of the protein changes and this ion channel opens and ions flow into the cell. At least that's the way we presently understand its workings.

BY MR. PLASSE:

Q. What, in fact, binds or interacts with the receptors? What chemical or molecule?

A. As I mentioned earlier, any molecule that has similarity to acetylcholine.

Q. And does nicotine have those qualities?

A. It has some of those, yes.

Q. So does nicotine, at times, bind and interact with the receptors?

A. Under what conditions? I mean --

Q. In general. In general. I mean, may it --

A. It's capable of binding and interacting with receptors, that's correct.

Q. If I divide up the process, roughly in half, one dealing with the binding with receptors and the changes there, and the other half dealing with the ions flowing into the cell, do you -- is that fair to do conceptually? I mean it's the beginning and the end?

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A. (Witness nods head.)

Q. Was your work initially focused on the first half of the process, the binding process?

A. The binding process? That's correct.

Q. And then at some point did you spend more time on the issue of what happens when the ions flow into the cell?

A. Yes.

Q. Can you chronologically tell me when you finished with one part and focussed more on the other part?

A. Let's see. Dr. Fluhler was probably the first to start studying the -- the ion flux process, using cells. And then we expanded the types of cells and receptors as we progressed. So, during his tenure, I guess, was the first time we -- we started doing functional studies.

Q. When was that, that those studies began?

A. Late '80s.

Q. And did you personally shift the focus of your attention at some point to the ion flux area?

A. That was an area that people in general, in academia, had been shifting their focus to; so we felt we needed to get in there and learn some more as well.

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Q. Okay. I'm referring to you personally. You personally?

A. Did I personally what?

Q. Shift your focus from the binding aspect -- the initial part of the -- the initial step of the binding as opposed to -- let me rephrase that.

Did you personally spend more time, at some point, dealing with the ion flux?

A. I would -- I wouldn't say spending more time, necessarily, as spending a portion of our time. Even to this day, the binding is still not completely understood, so we continue to study that.

Q. So, today, is most of your time spent on the binding and the ion flux portions of dealing with receptor -- receptors?

A. Primarily, yes.

Q. And you spend more time -- of your time on the ion flux aspect of it?

A. Not personally; I'm -- I'm not in the laboratory anymore. But the work that's going on in the laboratory is in that area, yes.

Q. Okay. Can you describe generally what you've learned so far about this second half, the ion flux or what -- you know, what processes occur, in terms

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of, you know, after the receptors respond to
nicotine?
A. Basically we understand more about the ions
that are flowing through the receptor.
Q. Can --
A. It turns out it doesn't appear to be very
selective. So, sodium, potassium, calcium,
basically any ion that's around.
Q. Okay. And what effect on the other -- on the
body does this ion flux have, if any?
A. Well, that -- that would be a pretty long
extrapolation. Really -- at the level we're
studying it, we can only address issues related to
what happens to the cell, primarily.
Q. Okay. And what have you -- what have you
found with respect to the cell?
A. It's -- it's believed now, not only from our
work, but also from other work in academia, that as
a result of -- of that ion flux, you can get a
depolarization of the cell membrane.
Q. And can you describe in lay terms what that
is, depolarization of the cell membrane.
A. Typically, a cell will have -- there will be
a difference in potential -- electrical potential
between the inside and the outside of the cell.

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And so depolarization is the diminishing of that potential difference.

Q. Are you familiar with certain physiological effects resulting from a smoker obtaining nicotine from cigarette smoking? For example, like increased heart rate, or things along those lines?

A. I've -- I've seen those things referred to in the literature, yes.

Q. Let me go through some of these and see if you're familiar with them. Are you familiar with nicotine possibly causing a decrease in body temperature? And this is all in the context of someone smoking a cigarette and obtaining nicotine as a result of that.

A. I'm not familiar with that in the human system; I have seen data on that in the -- in rodents.

Q. Are you familiar with nicotine increasing salivation?

A. That, apparently, is one effect, yes.

Q. Have you seen that addressed in -- or studies addressing that response in humans?

A. Not the salivation response, per se, but I've seen studies of -- of sal -- saliva studies, to look at nicotine metabolites.

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Q. Okay. How about are you aware of nicotine increasing hormonal release?
A. Yes, I've seen reports to that effect, from animal studies.
Q. In general, what -- what does that -- what do those studies show?
A. You can get release of norepinephrine, for example.
Q. Are you familiar with studies or research describing nicotine's effect on the hypothalamus?
A. I've -- I've seen basic research studies where they -- they culture cells from the hypothalamus and study the receptors.
Q. Okay. And is there any effect between the nicotine and -- on the hypothalamus, any type of causal relationship between --
A. Causal to what?
Q. I withdraw the question.
Are you familiar, generally, with the effect of nicotine on the cardiovascular system?
A. Generally.
Q. What is that effect?
A. Primarily what I've seen is related to heart rate and blood pressure changes that can occur.
Q. Use of nicotine may increase the heart rate;

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is that -- is that true?
A. That's correct.
Q. I'm sorry. Heart rate; was there anything that you mentioned --
A. Well, use of nicotine; I don't know whether --
Q. Well, a smoker smoking a cigarette --
A. You can see heart rate changes, that's correct.
Q. I'm sorry, you mentioned two things, heart rate and something else.
A. And blood pressure.
Q. Blood pressure. All right.
So if someone smokes a cigarette, the nicotine that he obtains might increase his blood pressure?
A. Potentially.
Q. Okay, just focusing on the effects use of nicotine can have on heart rate and blood pressure, based on your research, are you able to -- well, is it fair to say that nicotine's effect -- biochemical effect on the body is in large part derived from its binding with the receptors?
A. I would say in part. I don't know whether it would be on the same large part or not.

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Q. Okay. Well, let me ask you this. Do you have a view as to whether the potential increase of heart rate and blood pressure in humans is triggered or the result, in part, of nicotine's binding with the receptors?
A. One could hypothesize that, yes.
Q. Do you hypothesize that?
A. Not personally, no.
Q. Okay. Why don't you? I mean, is there some other explanation?
A. Well, I mean, it's just not an area that I work in. I mean, I can understand where somebody would -- could hypothesize that.
Q. How would they hypothesize that? I mean, what would be the connection between -- I mean, the smoker smokes a cigarette, the nicotine is absorbed into his system --
A. Correct.
Q. -- it binds with the receptors. Down the road there is a potential of increase of heart rate and blood pressure. What's the --
A. It may --
MS. FEE: Hang on, let him --
BY MR. PLASSE:
Q. What are the intermediate stages, if you

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know?
A. Again, I can only suppose that you could have such effects from interaction with the ganglionic receptors, which I mentioned earlier. But, at this point, very little is understood about that.
Q. Are there efforts at pharmacology division to try to further study those areas -- that area?
A. Not in terms of mechanistics, no.
Q. What do you mean by "mechanistics"?
A. Mechanism of how it all works.
Q. Okay.
A. Which is basically our focus on mechanism.
Q. Well, so what are you studying? You're studying the ion flux --
A. Right.
Q. -- that's one area you're focusing on. I mean, does the ion flux at some point result -- or trigger the -- or relate to the increase in heart rate or blood pressure caused by smoking a cigarette?
A. It may.
Q. Would you hypothesize that?
A. It may.
Q. But your pharmacology division doesn't get to the point -- that point of how blood rate -- blood

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pressure and heart rates are impacted by smoking cigarettes?

A. No. That's not our particular area of interest.

Q. All right. You focus on the ion flux, what happens to the cell, and then that's it? I'm just trying to get a sense of where your -- where your studies end.

A. Well, in the case of the CNS receptors, we're interested in how neurons -- the functioning of neurons and -- and results from those interactions.

Q. What, generally, have you learned about the functioning of neurons in that context?

A. I mean, we and others have studied this area about the same time with -- all finding the same types of things, that nicotinic receptors in the CNS are primary neuromodulatory.

MR. PLASSE: I'm sorry, could you read that back, please.

(WHEREUPON, THE ANSWER WAS READ BACK BY THE COURT REPORTER AS FOLLOWS:

I mean, we and others have studied this area about the same time with -- all finding the same types of

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things, that nicotinic receptors in the CNS are primary neuromodulatory.

BY MR. PLASSE:

Q. What's neuromodulatory?

A. Modulating the release of neurotransmitters.

Q. Can you describe what modulating the release of neurotransmitters are, in lay terms.

A. Some of these receptors -- I guess a lot of the receptors that are being studied in CNS are on nerve endings and modulate the -- the release of neurotransmitters in response to nerve traffic.

Q. Going back to what I was calling the first part of the process, that is, the binding effect between the nicotine and the -- excuse me, the receptors, when you do your studies or have done your studies on rats, how did you determine what amounts of nicotine to use in the testing? Are there factors that guide you?

A. You're talking about studies with whole animals or tissues or --

Q. Tissues. Tissues.

A. You don't know a priori; you have to go in and explore that.

COURT REPORTER: You don't know --

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I didn't understand --

THE WITNESS: A priori. What those levels -- you have to -- that's part of what we're trying to understand.

BY MR. PLASSE:

Q. So is it true that certain levels of nicotine in your tests with animal tissues will not trigger -- or will not trigger a type of binding response that you're looking for?

A. No. There is a dose response relationship, yes.

Q. Have you done any studies that deal with that general issue -- general subject about the dose response relationship?

A. Yes. That's typically one of the parameters that we measure.

Q. Okay. And, in general, what have you found? I mean, do you find that there are specified doses that will generate the response and others that don't?

A. Well, if you go to certain low levels, you know, that's -- basically the definition of a dose response, at some point.

Q. And that's --

A. But it's more complex than that, because you

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don't get a -- always get a one-to-one relationship between the size of the effect and the biological response. That can vary.

Q. Is it fair to say, based upon the studies that you've done on dose response relationships with that tissue, that there's a minimum amount of nicotine necessary to trigger the binding response in humans?

A. I don't -- I don't see how you could extrapolate that. Because, even at the cellular level, it's hard to really predict a direct relationship between binding and response.

Q. Okay.

A. Because there's -- there are issues of spare receptors. I mean, pharmacologically, it's a very complex thing to sort out.

Q. Okay. Well, let's focus on receptors in the CNS, central nervous system, in humans. Is it necessary, in order to trigger a response from nicotine, that a certain dosage of nicotine must be -- I'm not sure what the verb is, introduced into the system to -- to bind with the receptor?

A. That was kind of a long one. You might have to run that one by me one more time.

Q. I'll rephrase it. I'll rephrase it.

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I mean, do you have a view that there's certain minimum doses of nicotine necessary to generate a binding process of receptors in the central nervous system?

A. Typically, the easiest way to measure the interaction of a compound like nicotine with the receptors is to measure a so-called EC50. And that gives you kind of a crude measure of how much of a compound or ligand it takes to activate half of the receptors.

Q. Okay. EC50 is a type of test?

A. It's -- no, it's a measure -- it's a measure of the dose -- a certain point on the dose response curve.

Q. Okay.

So -- and that measure is seeking to measure what dose triggers half, you said, of receptors responding?

A. Yes.

Q. Receptors in CNS?

A. Any receptor that you choose to study. It's a -- it's a very general approach.

Q. Is EC50 something -- some proprietary analysis of RJR?

A. No, no, no. That -- that's a --

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Q. Is it industry-wide?

A. No, that's a general term used by all pharmacologists.

Q. Okay. So is it fair to say that, if I lit a cigarette and took one puff, and then, later on, the next day, I lit a cigarette and smoked the entire cigarette, that smoking the entire cigarette would trigger more of a binding process with CNS receptors than the one puff?

A. There's no way you could predict that.

Q. Isn't that likely, though? All things being equal -- all other things being equal?

A. No. Because you -- there's no way to predict how much is going to be absorbed. The -- the whole animal system is a -- is very difficult to work with, which is why we're kind of working our way up from the molecular level; it's -- there are just too many variables.

Q. So you're not able to say --

A. People metabolize things differently, they take things up differently. I mean, it's -- there's just no way to predict.

Q. Okay. In your testing, do you measure the amount of nicotine that's taken into this -- well, I'll withdraw that.

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It's possible to measure the amount of nicotine within, for example, a person, isn't it, by taking blood and measuring nicotine levels there?
A. It is possible, yes.
Q. Okay. Is it fair to say that, by virtue of my smoking a cigarette and -- I'm sorry, withdraw that.
Is it fair to say that increased nicotine levels in the body would tend to create a greater binding of receptors in the central nervous system?
A. Not necessarily.
Q. All right. But as a general matter, is there a general correlation between high levels of nicotine creating a greater response of receptors in the central nervous system?
A. In in vitro models, that's correct. But, again, one has to consider the complexity of the system. And that's where it breaks down. Which is a frustration of doing molecular approaches to these things, in general. But ...
Q. Have you done any studies on compounds or chemicals other than nicotine in your work at RJR?
A. Yes.

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Q. Which other chemicals or compounds have you looked at?
A. Several hundred.
Q. Oh, okay. I'm sorry.
Let me try it this way.
What about caffeine? Have you looked into how caffeine affects, if at all, receptors?
A. We have not actually done caffeine in our laboratory, no.
Q. Okay. Do you have an understanding, based upon what you may have read as to what -- how caffeine interacts with receptors?
A. In a general way, yes.
Q. Okay. What's that way?
A. Again, I haven't read that literature in quite a while. The last time I did read it, my understanding was that methylxanthenes in general, of which caffeine is one, interact with adenosine receptors.
Q. Is that a different type of receptors --
A. Yes.
Q. -- than those that interact with nicotine?
A. Yes.
Q. Does it have a similar biochemical response?
A. I believe adenosine -- well, I don't want to

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misspeak. I'm not sure -- I can't remember exactly how the adenosine receptors work.

Q. I mean, do you have that ions flux that you have with nicotine receptors -- nicotinic receptors?

A. My recollection is that you -- that you don't. But, again, I haven't seen that literature in quite a while.

Q. How about marijuana or compounds of marijuana; do they interact with different receptors in the body? I'm sorry, with receptors in the body?

A. Compounds -- what kind of compound, specifically?

Q. I guess, marijuana or any type of derivative of marijuana.

A. I mean, marijuana is a plant, but, I mean --

Q. I'm sorry. Okay. I'm actually thinking of your testimony in the other Arch case. I -- well, I thought you indicated that one of the chemicals or components of marijuana might have an impact upon receptors; is that true?

A. That's possible.

Q. Have you ever read that anywhere or heard that anywhere?

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A. I've heard it proposed; but I'm not aware of any literature that's really sorted that issue out.

Q. Okay. And do you know whether there's a similar type of ions flux as there is in the -- resulting from the binding of nicotinic receptors?

A. Similar to --

Q. Let me withdraw the question.

Dealing with the chemicals or compounds derived from marijuana and their impact upon receptors, do they respond to them in a manner similar to the way that you have this ion flux in connection with nicotinic receptors?

A. Again, I'm not aware of anybody that's characterized those receptors. So, I can't answer that.

Q. How about cocaine? Does that have any impact upon receptors in the body?

A. There is an interaction with proteins, cellular proteins. They're not receptors; I wouldn't classify them as receptors, per se.

Q. So, a part of the cocaine interacts with a cellular protein? Is that --

A. Yes.

Q. And is that interaction comparable in any way to the way that nicotine reacts to receptors?

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A. No.
Q. How is it different?
A. My understanding is that it binds to an -- an uptake protein that -- that takes molecules into the cell. Which is -- I guess they refer to those as transporter molecules.
Q. And then there, in turn, I guess there's some type of physiological response to that, is that correct, in the body?
A. Well, one could hypothesize that there is, yes.
Q. That's not your area of expertise?
A. No, it's a little bit outside --
Q. Way, way gone -- far away?
A. Far enough away not to be able to speak definitively about it.
Q. Do you know whether cocaine produces any physiological effects on humans, similar to the effects of -- derived from smoking cigarettes?
A. I mean, I've never seen -- I mean, I've seen people try to compare those things in the literature, but I'm not really familiar with the literature in that area.
Q. Well, have you ever seen in the literature any indication that cocaine may increase a person's

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awareness or increase their heart -- heart rate?
A. No, I've never seen anything to that effect. Again, I -- I don't read that literature, so ...
Q. Okay. How about heroine? Does it have any impact upon receptors in the body, that you're aware of?
A. Again, that's outside. But I -- to the best of my knowledge, it interacts with receptors, yes.
Q. And can you describe, to the extent that you know, what the nature of that interaction is.
A. I believe it interacts with so-called opiate receptors.
Q. Where are the opiate receptors located?
A. Umm.
Q. What part of the body, if you know?
A. I presume -- no, I really don't know. Again, that's not the literature that I -- that I typically read, so ...
Q. Just going back to the cellular proteins that you referred to in the context of cocaine, where are those proteins located, if you know?
A. There are some that have been identified on nerve endings.
Q. Do you have an understanding as to whether there are any similarities between the biochemical

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effects of heroine in the body and the effects of nicotine in the body?

A. None, that I can think of.

MR. PLASSE: Can we take like a five-minute break?

VIDEOGRAPHER: We're going off the record at 11:13 a.m.

(RECESS TAKEN FROM 11:13 A.M. TO 11:25 A.M.)

VIDEOGRAPHER: We're going back on the record at 11:25 a.m.

BY MR. PLASSE:

Q. All right. Dr. Lippiello, you're currently employed by RJR, right?

A. I'm sorry?

Q. You're currently employed by RJR?

A. Yes. Yes, I am.

Q. I just want to follow up on, I guess, some area I was pursuing before.

We talked about the cardiovascular effects resulting from nicotine derived from smoking, generally.

A. Okay.

Q. I mean, are you familiar with the specifics of those types of -- well, I guess we talked about increased heart rate --

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A. Uh-huh --
Q. -- and blood pressure as two of those effects, right?
A. Right. That's correct.
Q. Any others that you're generally familiar with?
A. Cardiovascular effects?
Q. Yes.
A. Those are the two that you hear about the most, yeah.
Q. Okay. Now, is it fair to say that the cardiovascular effects resulting from nicotine obtained from smoking result from the binding process between the receptors and the nicotine?
A. It is -- it is possible that binding of nicotine in certain receptors could result in those effects.
Q. Okay. Do you know any other reasons or -- well, some other cause, other than that binding process, that causes the cardiovascular effects resulting from nicotine obtained from smoking?
A. I do not know of any, but I could not rule them out, either.
Q. Okay. I have a similar line of questions for nicotine's impact upon the central nervous system.

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We talked generally about nicotine's impact upon the central nervous system. Do you recall that?
A. I can't recall specifically what we talked about, but --
Q. All right, well, let's do it this way.
A. There were a number of things.
Q. What impact does nicotine, obtained from smoking, have on the central nervous system?
A. We don't know the answer to that. At least I don't personally know the answer to that.
Q. Oh, okay. I mean, there aren't any particular symptoms or behavior that you're aware of that result from nicotine's impact upon the central nervous system?
A. Nicotine -- well, work that's been done in animals with nicotine I'm familiar with.
Q. And what does that show, if you know?
A. Regarding?
Q. Nicotine's impact upon the central nervous system. What the nature of the impact is.
A. There's a whole body of literature showing that you can increase cognitive function, for example, learning and memory.
Q. Okay. So do you have a view as to whether nicotine obtained from smoking, in humans,

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affects -- affects humans' cognitive functions?

A. Obtained from -- I'm not familiar with the smoking literature, but I am familiar with nicotine patch work that's been done in humans. And, yes, they have demonstrated that it improves cognition.

Q. Is there some reason to believe that nicotine obtained from smoking wouldn't have a similar result on cognitive functions in humans?

A. I guess I have no reason to believe that, no.

Q. Let's see. In terms of general areas of the body affected by nicotine, we talked about central nervous system, cardiovascular system. What other general areas of the body are -- are affected by nicotine, if you know?

A. I think we also mentioned the gastrointestinal.

Q. Okay. Anything else? What about ganglia? Is that something separate or ...

A. Ganglionic interactions are parts of many of those things.

Q. Okay. Okay.

Anything other -- in terms of general parts of the body, other than gastrointestinal, CNS and cardiovascular, in terms of what impact nicotine has on the body?

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A. Those are the main areas that I'm aware of.

Q. And what generally are the gastrointestinal -- I'm sorry, how does nicotine obtained from smoking affect the -- I'm not sure what you call it, gastrointestinal part of the body?

A. Again, I'm not as familiar with nicotine obtained from smoking. But nicotine can cause GI disturbances: Nausea, vomiting, those sorts of things.

Q. Well, so you're referring to information relating to nicotine patches' effect on the gastrointestinal system?

A. People have reported those effects from the patch, that's correct.

Q. And, in the nicotine patch, is -- is there a similar process whereby nicotine interacts with receptors in parts of the body to create a --

A. It's possible.

Q. -- result?

Well, I mean, is there any reason that you have that you think that the nicotine in a nicotine patch would interact differently with receptors than nicotine obtained from smoking?

A. I -- I would have no reason -- I mean,

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there's no evidence that I'm aware of that would suggest that.

Q. So do you have a view or a hypothetical view as to whether the nicotine in a nicotine patch affects receptors in a similar way that nicotine obtained from smoking does?

Did I lose you?

A. Yeah.

Q. Do you have a view or an opinion as to whether the nicotine obtained from a nicotine patch affects receptors in the body the same or similar way that nicotine obtained from smoking does?

A. I mean, any evidence to the contrary -- again, as I mentioned earlier, I have no reason to believe that they would be different.

Q. All right. Turning back for a moment to nicotine obtained from smoking's effect on the cardiovascular system.

Is it fair to say that certain minimal -- minimum doses of nicotine would not bind with receptors and therefore not trigger that response on the cardiovascular -- a response in the cardiovascular system?

A. I think that would be a reasonable hypothesis.

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Q. Is it fair to say that a minimum amount of -- let me withdraw that.

Is it fair to say that certain minimal levels of nicotine obtained from smoking would be so low as to not bind with receptors and produce any effect on the central nervous system?

MS. FEE: Object to the form.

THE WITNESS: Could you repeat the question, please.

MR. PLASSE: Could I have -- two questions before, please. The one about the cardiovascular system.

(WHEREUPON, THE RECORD WAS READ BACK BY THE COURT REPORTER AS FOLLOWS:

Is it fair to say that certain minimal -- minimum doses of nicotine would not bind with receptors and therefore not trigger that response on the cardiovascular -- a response in the cardiovascular system?

BY MR. PLASSE:

Q. I have a similar question with respect to the central nervous system. Is it fair to say that

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certain minimum dosages of nicotine would not bind with receptors and therefore not trigger a response in the central nervous system?

A. It would be possible to hypothesize that, yes.

Q. I believe you testified in that Arch deposition that one of the first or early things you did at RJR was a study about lip coverage on filters. Do you recall that testimony?

A. I don't recall the testimony specifically.

Q. Okay. Do you recall doing a study on lip coverage on filters sometime while you were at RJR?

A. Yes, I do.

Q. Okay. And in general, what was the subject of that study?

A. It was trying to -- to see what the -- the basic approach was to try to measure what the maximum lip coverage was, on average, on a filter, by people smoking ad lib.

Q. I'm sorry, people smoking, what?

A. Ad lib.

Q. Ad lib?

A. Ad libitum; smoking their own brand, ad libitum.

Q. And did you have an understanding as to why

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that research or study was being requested?
A. Yes.
Q. Why was that?
A. It was to gain some information that could be relevant to a -- a case that was going on at the time.
Q. And this was lip coverage on the filter?
A. Yes.
Q. Does the filter have certain vents or holes in it, the ones that you were -- that were involved in the study?
A. Yes.
Q. So did you have an understanding as to whether, if the lip coverage was sufficient as to cover all the vent holes in the filter, as to whether that would have any impact on the amount of nicotine obtained by the smoker?
A. That was -- that was a long one; you may have to break that one down.
Q. Okay. You're seeking to measure lip coverage on a filter.
A. Correct.
Q. The filter has got vent holes in it?
A. Correct.
Q. Did you have an understanding as to whether

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if -- and by "lips" it means the lips of the smoker, right?

A. Correct.

Q. Did you have an understanding as to whether, if the lips of the smoker covered all the vent holes, that that smoker would obtain more nicotine than he would than if his lips did not cover all the vent holes?

A. I didn't have a specific understanding of that, no.

Q. Well, is that likely, that if, in fact, the lips cover all the vent holes, that the smoker would tend to obtain more nicotine than he would if he didn't cover all the holes -- vent holes?

A. Again, I don't know enough about the mechanics of the cigarette to know that.

Q. Did you have any understanding as to whether smokers using that type of filter would have any reason to cover all the vent holes than not cover all the vent holes?

A. (No response.)

Q. You don't know or you don't understand my question? The question doesn't make any sense?

A. No.

Q. Sorry.

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I'll withdraw the question.
What were the results of your study?
A. The conclusion was that, on average, the smoker's lips did not cover -- reach the same distance on the filter as the vent holes were located; several millimeters short of that point.
Q. Are you aware of any other research that concluded differently, that the smoker's lips in another study indicated that the lips did cover sufficient -- cover all the vent holes in the filter?
A. No.
Q. Did you have an understanding as to whether, if the smoker's lips did cover all the vent holes, the smoker would get more nicotine by smoking?
MS. FEE: Objection. Asked and answered.
MR. PLASSE: You can answer. You can answer.
MS. FEE: If you can answer it, you can.
THE WITNESS: The -- my understanding was that they were trying to get a handle on whether the amount of smoke delivered changed with coverage of the vents. I think that

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was the main -- the main area of interest.

BY MR. PLASSE:

Q. Did you have an understanding that if the amount of smoke increased, as a result of coverage of the vents, then the amount of nicotine would also increase?

A. Again, one can hypothesize that; but in the absence of a measurement ...

Q. It's likely that it would?

A. No, I'm saying in the absence of a measurement, I can't say.

Q. At the pharmacology division, while you were there, we talked before about how you did work on receptors and pharmacokinetics, right?

A. I did not do work on pharmacokinetics, no.

Q. Work in the pharmacology division included --

A. Included --

Q. -- that. Not necessarily by you.

And the study of pharmacokinetics dealt with nicotine; is that correct? There was a focus on nicotine and how quickly that went through organs? Appeared --

A. They were looking at plasma levels, yes.

Q. Plasma levels of nicotine?

A. Yes.

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Q. Any other chemicals or compounds?
A. I really can't recall. They may have -- they may have looked at cotinine, but I'm not sure.
Q. Is cotinine a derivative of nicotine?
A. Yes.
Q. It's a metabolic?
A. It's a metabolite.
Q. Okay. So -- just trying to summarize. There's your work on receptors, there's work on pharmacokinetics; both of those involve principally nicotine; is that right? Studies relating to nicotine?
A. No, that's not correct.
Q. Why is that not correct?
A. The receptor work was really more basic research on the receptor system. And nicotine was just one of many molecular tools that we used.
Q. Okay. But isn't it true that the focus, in terms of molecular tools, was nicotine -- let me withdraw that.
Nicotine was one of the molecular tools; is that correct?
A. Yes.
Q. And wasn't it the principal molecular tool that was used in the study of the receptors?

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A. No. It was just one of quite a -- quite a few, actually, even at the time we got into the research.

Q. What were some of the other molecular tools that were used?

A. Other nicotine and acetylcholine-like molecules.

Q. But they were all related to nicotine?

A. Not identical with, but related to, yes.

Q. I mean, it wasn't that -- you weren't doing studies about caffeine.

A. We did not do any caffeine studies.

Q. Okay. You didn't do any studies about heroine or cocaine, did you?

A. No.

Q. So is it fair to say that nicotine or nicotine-related compounds or chemicals were the primary focus of the pharmacology division?

A. No, I don't think that's fair to say.

Q. Why not?

A. The focus was the receptor system.

Q. Okay. And the receptor system was viewed -- or you were looking at how nicotine or nicotine-related compounds or chemicals impacted upon the receptor system; isn't that correct?

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A. Yes. In order to understand the features of the receptor.

Q. In other words -- well, looking at it in another way, in terms of molecular tools, nicotine was the primary one used within the pharmacology -- nicotine compounds, related to nicotine, was the primary one used in the pharmacology division and studied, wasn't that true?

A. Those were -- those were among the tools that we used.

Q. Okay. Well, I think you indicated there may have been some -- identified some other molecular tools that were related to nicotine in some fashion, right? Or were derivatives of nicotine?

A. Umm --

Q. All right. I withdraw that question.

I'm going to show you what was marked as Lippiello Exhibit Number 1 in your prior deposition. Other than at your deposition, have you ever seen this document before?

A. Other than at my deposition?

Q. Right.

(WITNESS REVIEWS DOCUMENT)

A. Let me look at this one more time. It was '83.

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It's likely that the deposition was the first time I'd seen this in a long time, if I remembered seeing it at all.
Q. Okay. Well, do you recall receiving it in around May of 1983 --
A. No.
Q. -- which is the date?
A. I can't -- I can't really recall that far back, no.
Q. I mean, as you look at the document, is there some reason to think that you would not have received it in May -- May of 1983?
A. I -- you know, I may not have, because it's not specifically addressed to me.
Q. You're listed as the project leader on the first page of the exhibit. As project leader, you wouldn't have received a copy of the -- of the document?
A. It's possible that I may not have. It may be -- it may have been a synopsis, for example, that John Reynolds was preparing for his management.
Q. What was your relationship to Mr. Reynolds in 1983?
A. He was my supervisor.

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Q. Let me just read into the record under "Description/Background". (Reading)

Current theories of the action of endogenous or exogenous agents on the central nervous system postulate that observable psychophysiological effects are brought about by chemical interactions (binding) of these agents with specific areas (receptors) located in or on specific cell types within the CNS.

I guess one question I have is what -- do you have an understanding what the term "endogenous" means as used in this context?
A. Endogenous means within -- within the body.
Q. What about "exogenous"? Do you have an understanding of what that refers to?
A. Also in this context?
Q. Yeah, in this context.
A. From without the -- from outside of the body.
Q. The next sentence reads, quote: (Reading)

Therefore, to fully

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understand exactly how agents
produce their effects, it is
necessary to locate and
characterize receptors,
identify the cell types or
brain areas with which they
are associated, and determine
what specific neurochemical
processes or agents occur --

MS. FEE: I think it says "events".

MR. PLASSE: I'm sorry, "events".

(Reading)

-- occur as a result of
interactions of the receptors
and active agents.

Did you have an understanding, in May of 1983, that it was -- in order to fully understand exactly how agents produce their effects, it was necessary to locate and characterize the receptors and identify the cell types of brain areas with which they were associated?

THE WITNESS: That is one approach that was proposed at the time, yes.

BY MR. PLASSE:

Q. Okay. And was that approach followed?

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A. Yes.
Q. I mean, that approach was followed, in fact, by, in part, virtue of your work on receptors; isn't that true?
A. Correct.
Q. Under "Commercial" -- under "Commercial" on the first page of the exhibit, it states, quote: (Reading)

Arrest the declining social acceptability of smoking.

Then there's some handwritten notation. Is that handwriting yours, do you know?
A. It does not appear to be mine, no.
Q. I think the handwriting says, quote: (Reading)

New products resulting from enhancement of benefits.
[End quote.]

Did you have an understanding in -- in May of 1983 that your work had any commercial application?
A. No, not at the time.
Q. Do you now have any understanding as to whether it had any commercial application?

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A. Do I understand now -- could you --
Q. Well, focusing on your work on receptors, do you have an understanding as to whether now -- do you now understand whether it had any commercial application?
A. That's the part I'm -- I'm losing you on, "had".
Q. Okay. Had or has?
I'll rephrase the question since you're -- seem to be puzzled by it.
A. Well, you keep going -- I'm not sure where you are in time.
Q. Right. Okay.
What commercial application, if any, does your work in receptors have?
A. Presently, it has --
Q. Presently, yeah.
A. -- potential commercial application in therapeutics.
Q. Like in connection with treatment of Alzheimer's disease?
A. Partly in connection with Alzheimer's disease, that's correct.
Q. Anything else?
A. There are a number of diseases now that have

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been shown to -- to respond positively to nicotine or nicotine-like compounds.

Q. Okay. What other ones?

A. Attention deficit, Tourette's syndrome, ulcerative colitis, Parkinson's disease. Those are the primary ones. Schizophrenia, possibly.

Q. Were you aware that -- I'm sorry, could I have my question that he responded to read back.

(DISCUSSION OFF THE RECORD)

(WHEREUPON, THE QUESTION WAS READ BACK BY THE COURT REPORTER AS FOLLOWS:

What commercial application, if any, does your work in receptors have?

BY MR. BLASSE:

Q. When was the first time you became aware that your work on receptors had some type of commercial application to Alzheimer's disease?

A. I'm not sure it was an awareness of the commercial application at the time, but an application, certainly.

Q. Okay.

A. Because of the epidemiology that was coming out, showing inverse correlation between Alzheimer's and smoking.

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Q. Okay. When did you become aware of that inverse correlation?
A. That was mid to late '80s.
Q. Okay. So when you started your work on receptors, you were not familiar with that inverse correlation between smoking and Alzheimer's disease, were you?
A. No.
Q. So prior to your learning about the inverse correlation between smoking and Alzheimer's disease, were you aware of any commercial application of your work on receptors?
A. I was not aware of any, no.
Q. Did you have reason to believe that others at RJR, including those above you that you reported to, or management, had any understanding as to whether your work on receptors would have any commercial application, prior to the time that you learned about the inverse correlation between Alzheimer's disease and smoking?
A. I can't say -- no. They may have, but I was not aware of it.
Q. Do you have any understanding what the reference is to "arrest the declining social acceptability of smoking" is, that's referred to on

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the first page of Exhibit 1?

A. The question regarding that phrase was?

Q. Do you know what that refers to?

A. Not specifically. I mean, at the time -- I wasn't aware of that, at the time, no.

Q. Okay. Well, were you aware, at or about that time, that RJR or any other cigarette manufacturer was concerned about the level of tar in their cigarettes and were seeking to reduce the amount of tar in their cigarettes?

A. Not at the time, no.

Q. Were you aware, at or about that time, in 1983, that market share of cigarettes were declining?

A. No. At that time I was completely focused on my research. So I really was not aware of that.

Q. Did you do any work in connection with the Premiere or Eclipse projects at RJR?

A. No.

Q. Were you aware that there was a development of a Premiere cigarette while you were at RJR?

A. Only after it was introduced.

Q. And when you say "introduced," you mean --

A. Into test markets.

Q. Uh-huh. How did it do in the test marketing?

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Did you know?
A. Only in general terms. It didn't seem to do very well -- in general terms, my recollection is it didn't do very well.
Q. Did you ever have any understanding as to whether Premiere was designed to be a cigarette with a lower tar amount than other cigarettes manufactured by RJR?
A. You mean -- after it was introduced, it became obvious from the -- the data that were being generated that it was, yes, lower -- lower tar.
Q. And did you have an understanding as to the motivation, if any, that RJR was at that time trying to promote a lower tar cigarette?
A. No. Not to my knowledge.
Q. Did you have anything to do -- well, when did you learn -- did you have ...
Did there come a time when you learned that Eclipse cigarettes were being test marketed?
A. Yes.
Q. Okay. Did you know about Eclipse before you learned about their being test marketed?
A. Only in the sense that there were continuing developments growing out of Premier.
Q. Okay. Did you have an understanding that

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Eclipse was intended to be a lower tar cigarette or a low tar cigarette?
A. Intended, no. I mean, I was aware that it had similar low tar properties.
Q. Similar to Premier. Is that --
A. Possibly similar to Premier, yeah.
Q. Did you have any -- any understanding as to the nicotine levels of Eclipse, at the time you learned of it being test marketed?
A. I remember seeing some numbers.
Q. Let me show you what was marked as Exhibit 2 at your deposition. Other than at your deposition, do you know whether you've ever seen this document?
A. No. Other than the deposition, no.
Q. Okay. On the third page of the -- no, I'm sorry, the fourth page of the exhibit, it's RJR 4368, there's a reference to paragraph 4, "Pharmacology of Nicotine" where you're listed, and particularly under subparagraph C, "Nicotine Titration".

Do you have an understanding of what nicotine titration is? As used in that context.
A. No. I wasn't aware of this. So I'm not sure what -- what it refers to.
Q. Let me show you what was marked as Exhibit 3

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to your deposition and ask you whether you've seen this document, Exhibit 3, other than at your deposition.

A. No, not other than at the deposition.

Q. Were you involved with the "Biobehavioral Research Program" that's referred to here?

A. At the time it was the biobehavioral division, yes.

Q. And let me ask you if you believe the statement referred to under "Background" is accurate. And I'll read it into the record. Quote: (Reading)

The Biobehavioral Research Program is a multidisciplinary program designed to yield knowledge about the physiological, psychological, and behavioral aspects of tobacco product use, with emphasis on smoking. It includes projects dealing with detailed smoking behavior, the physiology and pharmacology of nicotine, and

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the psychophysiological
effects of smoking.
Is that true to your knowledge?
A. To my knowledge, that was the overall background for that program, yes, or division.
VIDEOGRAPHER: Mr. Plasse, we have five minutes left on the videotape.
BY MR. PLASSE:
Q. And was the objective of that division as referred to in this exhibit that is to, quote: (Reading)

Develop knowledge about the physiological, psychological, and behavioral aspects of tobacco product use, for the following purposes: 1) aid in the design and development of new or improved products which address consumer wants, 2) define aspects of tobacco product use which are consciously or unconsciously perceived as benefits by users, 3) aid in addressing

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external issues.

Does that, to your knowledge, correctly refer to the objective of that division?

A. I really don't recall the first two objectives, per se. Our research, I know, was primarily focused around the third one, which is addressing external issues.

Q. Okay. And what is -- do you have an understanding of what the reference is to external issues?

A. It was a very general term at that time, relating to this philosophy, if you will, that we had of doing the research that we were doing to be able to deal with critics, for example, who might criticize us in those areas or to "have a seat at the table," is another way it's been put, have a right to an opinion, in anything that's research-related that could address external issues. I mean, that was really the impetus behind the basic research.

Q. Let me just go back to the reference to two, quote: (Reading)

Define aspects of
tobacco product use which are
consciously or unconsciously

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perceived as benefits by users. [End quote].

Do you have any understanding of what's being referred to there?

A. It's likely that that's referring to behavioral work that was going on in the division at the time.

Q. Okay. You were not involved with that behavioral work?

A. No. No. In fact, we were on opposite ends of the building.

Q. Was that Dr. Robinson who was involved with that?

A. He was one person involved in that, yes.

Q. Okay. Let me ask you, there's a reference under the heading "Technical Goals" to, quote: (Reading)

By 1985, have established an ongoing, state-of-the-art project for investigation of nicotine receptor pharmacology. [End quote.]

I mean, that was your balliwick, right?

A. Yes.

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Q. And did you have an understanding as to whether the reference under "Commercial/Financial Goals" was correct, that is, that the division was to, quote: (Reading)

Support the achievement of annual increases in cigarette share-of-market by the development of technology-based product advantages which address significant consumer wants?

A. And the question is, was I --
Q. Did you have an understanding as to whether that accurately refers to the commercial or financial goals?
A. I was really not aware of commercial or financial goals for our work at that time. "Our work" referring to my work.

MR. PLASSE: Why don't we break for lunch.

VIDEOGRAPHER: We're going off the record at 12:08 p.m.

(RECESS TAKEN FROM 12:08 P.M. TO 1:23 P.M.)

VIDEOGRAPHER: This is tape 2 of the videotape deposition of Pat Lippiello, Ph.D.

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We're going back on the record at 1:23 p.m.
BY MR. PLASSE:
Q. Let me show you what was marked as Exhibit 27 at your deposition. Do you recall ever seeing this document before?
A. Almost certainly -- from what I can tell, this was authored by me. So I almost certainly, at the time, saw it. It was signed by me also, apparently.
Q. Did you prepare the document on or about January 24th, 1985?
A. I would -- I would have to say yes, based on what I have in front of me.
Q. Did you prepare it in the ordinary course of your business at RJR?
A. Let's see. This is -- let's see if this was a -- this doesn't look like a report that I would have written. This looks like some research I did into people working in this area.
Q. But it was prepared during the course of your business?
A. Yes.
Q. And it was the ordinary course of your business to prepare this type of document?
A. Documents that would go to John Reynolds,

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yes, describe -- either describing our work or something of this nature.

Q. Mr. Reynolds was your superior at that point?

A. Yes.

Q. And do you know if this is a true and correct copy of the document that you prepared?

A. Let me see. It -- it appears to be, based on what I -- what I have in front of me.

Q. Okay. If you could turn to the first page of the exhibit, I will have a number of questions. I'm basically going to ask you whether, you know, it's a true statement, to the best of your knowledge. Under "Introduction" it says, quote: (Reading)

> The major goal of the Biobehavioral division, as we understand it, is to define in detail the complex interactions of consumers and product which form the basis of smoking behavior.

Is that correct, as far as you know?

A. In the most general sense, I would have to agree, yes.

Q. Skipping to paragraph roman numeral II,

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"Biobehavioral Research, Ames/Strategies," it states, quote: (Reading)

It is generally accepted that smoking is a complex, learned behavior, based on the perceived benefits which the smoker derives from a complex interplay of physiological and psychological factors.

Is that a correct statement, as far as you know?

A. As far as I know.

Q. Okay. It continues, quote: (Reading)

Further, it is believed that many, if not all, of the psychological benefits associated with smoking may be mediated by the interaction of nicotine with the central nervous system (CNS), particularly in the brain. [End quote.]

Is that a correct statement?

A. At the time, yes, that was the belief.

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Q. What do you mean by the term "mediated"?
A. In that -- in the context --
Q. In the context --
A. -- of that sentence?
Q. Right.
(WITNESS REVIEWS DOCUMENT)
A. Mediated in the sense that that interaction could form a part of how those -- those things -- benefits are perceived.
Q. Okay. It continues, quote: (Reading)
The pharmacological activation of virtually all neural pathways in the brain can be linked to specific receptor systems. [End quote.]
Is that a true statement?
A. Yes.
Q. Okay. It continues, quote: (Reading)
Therefore, a major aim of the Biobehavioral (animal) research program is to identify and characterize the sites and functions of putative nicotine receptors

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and to link receptor function to specific biochemical/biobehavioral -- [it's] S-E-Q-U-E-L-A-E.

A. Sequelae.

Q. Sequelae? Okay.

Is that a correct statement?

A. At the time that I was beginning my research, one of the aims ultimately, down the road, was to make some sense out of the work that I was doing in the broader context of -- of behavior, yes.

Q. Okay. And did you in fact accomplish that aim or --

A. No.

Q. -- achieve that aim?

A. We're still light years away from that.

Q. All okay. Fine.

It continues, quote: (Reading)

The overall strategy is to explore the interactions of nicotine with the CNS at all levels of tissue organization, both in vitro and in vivo. [End quote.]

Is that a correct statement when you

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wrote this?

A. Yes.

Q. I always get these confused. In vitro is what?

A. In the test tube, literally.

Q. And in vivo?

A. In -- in life or in -- in the animal.

Q. It continues, quote: (Reading)

The proposed model systems include neuronal, [N-E-U-R-O-N-A-L], cell membranes intact (cultured) neurons, brain slices, and whole brain (i.e., in vivo).

Is that correct?

A. Those were the models that we were proposing, that's correct.

Q. Quote: (Reading)

Only by adopting such a comprehensive approach can the relation of nicotine to CNS-mediated behavior be fully assessed. [End quote.]

Is that true?

A. Yes. That's the only approach that we could

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think of at the time that would even begin to address such a complex issue.

Q. Okay. Quote: (Reading)

The resulting database will undoubtedly contribute significantly to the design and/or interpretation of studies of human smoking behavior as well. [End quote.]

Did you believe that, when you wrote this document, to be true?

A. That was a hope, more than a belief.

Q. Let me show you what was marked as Exhibit 29 to your deposition.

MR. PLASSE: I only have one of these. Well, I only have one that I can give you. I'm sorry.

MS. FEE: That's fine.

BY MR. PLASSE:

Q. Can you identify Exhibit 29?

A. This appears to be a -- a memo to Dr. Hayes from myself and John Robinson.

Q. Okay. And do you recall what Mr. -- Dr. Hayes' position was in July 1985?

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A. I can't recall. He was -- well, he was either director or VP; I don't know. Probably director at that time.

Q. Director of what?

A. Director of biochemical/biobehavioral research group.

Q. And did you prepare this document on or about July 26th, 1985?

A. Let me just take a moment to look through this.

Q. Sure.

(WITNESS REVIEWS DOCUMENT)

A. This was, from what I can tell, prepared on that date and signed by myself and Dr. Robinson.

Q. Okay. And did you prepare this document in the ordinary course of your business at RJR?

A. I mean, typically we would prepare reports -- interim reports of various kinds, similar to the one we just saw before and -- uh-huh.

Q. So it was prepared during the course of your business responsibilities?

A. Yes. Yes.

Q. It's a business record, isn't it, of RJR, as far as you know?

A. An internal --

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MS. FEE: Object to the question, to the extent you're asking him to make a legal determination.
BY MR. PLASSE:
Q. In the ordinary course of business, you prepared these types of documents, didn't you --
A. Yes.
Q. -- as part of your responsibilities?
Is it a true and correct copy of the -- the original document, as far as you can tell?
A. As far as I can tell, yes.
Q. Okay. Why did you prepare this document? Do you recall? Was it to provide a summary to Dr. Hayes of what was being done at -- in your division at that time?
A. It appears to be a summary of -- of some of the approaches that we were taking, yes.
Q. If you would look on page 8, there's a heading "Neurochemistry," roman numeral III.
A. Okay.
Q. And it states, "Receptor Pharmacology." This is something you were personally involved in, weren't you?
A. Yes.
Q. It states, quote: (Reading)

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The characterization of
nicotonic (sic) --
nicotinic --
A. Nicotinic.
Q. (Reading)
-- receptors will be
essential to fully understand
the basis for all of
nicotine's behavioral and
neurophysiological effects.
[End quote.]
Is that a true statement?
A. We believed that to be true at the time we wrote this, yes.
Q. Quote: (Reading)
The most important
question to be answered is
"what are the endogenous
receptor systems which
interact with and respond to
nicotine?" (e.g.,
cholinergic).
A. Cholinergic.
Q. End quote.
Is that a true statement?

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A. One of -- one of the most important questions. Since then, obviously, there are many others to be addressed.

Q. Let me go back to the first sentence, referring to: (Reading)

The characterization of nicotine receptors will be essential to fully understand the basis for all of nicotine's behavior on neurophysiological effects.

Did there come a time when you believed that that statement was no longer true?

A. No. I still believe that's true.

Q. Just continuing, the third sentence of that paragraph, quote: (Reading)

This will be explored at RJR, at the tissue level, using isolated brain tissue in vitro, and at the cellular level using culture neurons. [End quote.]

That was a true statement?

A. Yes.

Q. And that's, in fact, what you did, right?

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A. Yes.
Q. Let me show you what's marked as Exhibit 35 to your deposition.
A. Okay.
Q. Do you recall whether you were asked questions about this document at your deposition in the Arch litigation?
A. I may have been, but there were a lot of documents in that other --
Q. Right. Well, fortunately for me --
MS. FEE: Yes, this one is numbered 35, so there really is that many.
BY MR. PLASSE:
Q. Have you seen this document before that deposition, if you saw it at the deposition?
A. I may have seen it at the deposition. And I -- I would have to conclude that I did see this, since it was written to me from Dr. deBethizy, at one point or other.
Q. In March 1987 what was your professional relationship with Dr. deBethizy?
A. Well, I believe at that -- well, no. I don't believe he had taken over the -- I think we were colleagues at that time.
Q. Okay. He was not your superior?

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A. No.

Q. Do you recall reading this document in or around March 1987?

A. I don't recall specifically. But, again ...

Q. You don't have any reason to believe that you didn't read it in March 1987, did you?

A. No reason to believe that.

Q. I mean, at that time if Dr. deBethizy would send you a memo, would -- was it your practice to read it?

A. Of course, yes.

Q. Let me read you some of the statements and ask you if you believe them to be true. On the first page under "Acute Effects" it says, quote: (Reading)

> The acute cardiovascular effects of tobacco smoking have been attributed mainly to nicotine. [End quote.]

Was that a true statement, then?

A. Based on the knowledge of the time, yes, that was a true statement.

Q. Then it continues, quote: (Reading)

> Nicotine causes the release of -- [I can't

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pronounce it,
E-P-I-N-E-P-H-R-I-N-E] --
A. Epinephrine.
Q. (Reading)
-- from sympathetic nerve endings by direct stimulation of sympathetic ganglia, sympathetic nerve endings, adrenal medulla, and C-H-R-O-M-A-F-F-I-N-E -- [no E. C-H-R-O-M-A-F-F-I-N] tissue. [End quote.]
Is that a true statement?
A. Yes.
Q. It goes on, quote: (Reading)
In addition, nicotine can activate chemoreceptors of the aortic and carotid, [C-A-R-T-O-I-D (sic)], bodies, stimulate parasympathetic ganglia, and at high doses cause complete G-A-N-G-L-I-O-N blockade. [End quote.}
Is that a correct statement -- true

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statement?

A. As far as I can tell, that was information available in the scientific literature.

Q. It continues, quote: (Reading)

The overall effect of this stimulation is an increase in heart rate, blood pressure, cardiac output, stroke volume, myocardial contractile -- [I can't read the last word, V-E-L-O-C-I-T -- I can't read it] -- induction and electrocardiographic changes. [End quote.]

Was that a correct statement?

MS. FEE: I think you skipped a line there.

MR. PLASSE: Oh, I'm sorry.

MS. FEE: That's okay.

BY MR. PLASSE:

Q. Let me do it again. Quote: (Reading)

The overall results of the simulation is an increase in heart rate, blood

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pressure, cardiac output, stroke volume, myocardial contractile [a word that I can't read] and force, coronary blood flow, myocardial oxygen consumption, arrhythmia induction. And electrocardiographic changes. [End quote.]

Is that a correct statement?

A. According to this document, this is quoted from the Surgeon General's report of 1979. So I presume that was quoting literature that was available at the time.

Q. Do you know whether the Surgeon General has changed his views on this subject since then?

A. I have not read any of the reports since then, so I don't know.

Q. On the last paragraph of the page it says, quote: (Reading)

Since the most of the effects of nicotine on the cardiovascular system, [it's missing a word, or may be

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missing a word], [are]
mediated by interaction of
nicotine with nicotinic
receptors in the CNS and
sympathetic ganglia, any
modification of the structure
of nicotine would also
modulate the CNS activity of
the alkaloid. [End quote.]
What's the reference to "alkaloid"
there, if you know?
A. Let me see.
(WITNESS REVIEWS DOCUMENT)
In that context, it looks like it refers
back to nicotine.
Q. Okay. Is that a correct statement?
A. Let's see.
(WITNESS REVIEWS DOCUMENT)
Hmmm. I mean, that's really posed, it
seems here, more as a hypothesis. Which I think
would be a viable hypothesis.
Q. Okay. It continues, quote: (Reading)
An avenue that may be
easier to separate from the
CNS activity of nicotine is

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the effects of nicotine on
platelet aggregation and the
role that this activity may
play in the exacerbation
of -- [and it's spelled]
A-T-E-H-E-R-O-
S-C-L-E-R-O-S-I-S (sic).
Did you or anyone else in the
pharmacology division look into the issue of the
effects of nicotine on platelet aggregation?
A. No, we did not.
Q. On the next page, it continues, quote:
(Reading)
Nicotine is thought to
produce its effects on the
circulatory system by
producing vascular
endothelial,
[E-N-D-O-T-H-E-L-I-A-L-],
damage. [End quote.]
Is that a correct statement?
A. It's -- no. It is thought to produce some
effects that way. Again, that's based on some
literature reports.
Q. Okay. Do you have -- are there literature

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reports since 1987 which take a different view as to this issue, that you're aware --

A. There may be, but I'm not aware of them. I don't read that literature at this time.

Q. Let me show you what was marked as Exhibit 38 at your deposition in the Arch litigation.

Can you identify what this document is?

A. It appears to be a memo -- well, there's several parts to it.

Q. Okay. The first page.

A. First page is a letter addressed "To Contributors," signed by me. Next page is the beginning of a memorandum to Dr. Hayes.

Q. Okay. And what follows after that?

A. A series of --

Q. Are these abstracts?

A. -- abstracts. Yes.

Q. Okay. What's the monograph that's referred to in the first page of the Exhibit 38?

A. This is the book that I referred to earlier, which was a -- the book that we put together from various contributors that we've collaborated with on various aspects of nicotine. And I believe the title was "The Biology of Nicotine".

Q. And if you look on page RJR 11256. Do you

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see that? Is this an abstract of an article "Effects of Nicotine on the In Vitro Models of CNS Neuronal Activity"?

A. Correct.

Q. So did you participate in the preparation of the entire article -- let me withdraw that.

Did you participate in the preparation of the article?

A. Of this particular article?

Q. Right.

A. This was through a collaborative effort. So I would say probably, at that time, I participated at the scientific discussion level, in terms of trying to plan studies, understand the results, that sort of thing, yes. But I did not conduct the studies personally.

Q. Okay. And, in fact, it's Dr. Fluhler, we talked about earlier, right?

A. Right.

Q. And he also worked on the project?

A. He was a consultant on that project, yes.

Q. If you could turn to -- the same page. If could you look, I mean, at the last sentence of the abstract. It says, quote: (Reading)

The fact that the

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presence of nicotine can have such a profound influence on other receptor mediated synaptic processes provides a potential neurophysiological basis for the motivation to increase nicotine levels in the human CNS via inhalation of cigarette smoke. [End quote.]

Can you describe in lay terms what's being referred to, the reference to the "other receptor mediated synaptic processes"?

A. Let me just first read the whole abstract, to remind myself of what we were doing here.

Q. Sure. Sure.

(WITNESS REVIEWS DOCUMENT)

A. Oh, I see what they were referring to now. They were -- they were looking at the -- the influence of -- this gets into the area of neuromodulation, which I referred to earlier. And they were apparently here looking at the modulation of glutamate and GABA, which are two other neurotransmitters in the CNS. And it looked, from these studies, as though those effects were

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modulated in some way by the presence of nicotine.
Q. And why would --
A. I don't know whether I would have used the word "profound," but certainly there appears to be an influence on other receptor mediated synaptic processes, and those are the processes they appear to be referring to here, the -- the other neurotransmitters.
Q. And why would that provide a potential neurophysiological basis for the motivation to increase nicotine levels in neurocentral nervous systems via inhalation of cigarette smoke?
A. That's a very good question. I mean, that looks to me like a viable hypothesis that could be tested. And so I guess that's why they used the word "potential" neurophysiological basis.
Again, at that time we were just trying to understand the basic mechanisms going on here in terms -- at the receptor level.
And, you know, since that time, many people in academia have pursued receptor-based mechanisms for nicotine's activities. So this was kind of the -- the beginnings of that process.
Q. Do you know what -- I'll mispronounce this too, L-E-V-U-L-I-N-I-C acid. Levulinic acid?

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A. Levulinic acid?
Q. Right. Do you know what that is?
A. Yes.
Q. What is it?
A. It's a -- an organic acid.
Q. Did you ever do any studies about levulinic acid while at RJR?
A. Yes, I did.
Q. Can you describe what they were.
A. It was part of a -- a more general study that we were doing to -- to look at the interaction of various nicotine-like compounds with the receptors that we were studying. And so, basically, nicotine levulinate was one of several dozen compounds that were present in the labs at that time that we just grabbed off the shelf, basically, and studied at random. Since we, at that time, didn't really have many -- any clues as to what kinds of compounds could be useful probes.
Q. So levulinic acid is a nicotine-like compound?
A. No, no. It's -- by itself, it's an acid; but it forms a salt with nicotine. As do many other acids. In fact, I think we studied probably a dozen different nicotine salts at the time.

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Q. Did that study involve whether levulinic acid could enhance the binding of nicotine to nicotine receptors?
A. That was one of the observations that was made during the course of that study.
Q. Okay. So it was observed that levulinic acid could enhance the binding of nicotine to nicotine receptors in rat brain membranes?
A. That's correct.
Q. Did you run any -- or publish any reports on that?
A. Yes.
Q. Do you know where?
A. I'm sorry?
Q. Do you know where?
A. In my -- they're in my file drawer.
Q. Oh, okay. Were they disseminated outside of your file drawer? Did they wind up in the library? RJ --
A. I presume the library will have a copy of that, yes.
Q. Did they wind up outside of RJR?
A. Not to -- no. Not to my knowledge.
Q. Is there a reason why they didn't leave RJR?
A. No particular reason; they were just reports

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prepared during the course of -- of activities. So they were filed as proprietary documents.

Q. Did anyone ever tell you that you shouldn't publish publicly your observations with respect to levulinic acid?

A. No.

Q. Did you ever have a view as to whether the addition of levulinic acid to nicotine or tobacco could increase the nicotine levels in the plasma -- nicotine levels in the plasma of a smoker?

A. No.

Q. You didn't have that view?

A. No.

Q. Is that a hypothesis that might be correct -- well, is that a viable hypothesis?

A. I would not make that hypothesis, no.

Q. Why not?

A. Because what we -- you know, the conclusion of -- of that work was that, since nicotine levulinate and all other nicotine salts dissociate as soon as they get into solution, at that point they would be diluted so much that any effects like that, that you -- that you would see kind of in a concentrated in vitro situation, would not occur.

Q. Did you ever do any testing on that, to see

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if it would occur?
A. No. We were more interested in the -- in the basic properties of the receptors and if we could use that as a tool to understand them better.
Q. Did you speak to anyone outside of pharmacology about the ability of levulinic acid to enhance the binding of nicotine to nicotine receptors?
A. Except -- not in terms of speaking, but except those people who would have been privy to the report.
Q. Who would that have been?
A. If they were filed in the library, as they traditionally are, then they would have been accessible to all R & D.
Q. Did you ever discuss that study with anyone outside of pharmacology?
A. I may have, but I can't recall specifically.
Q. Do you know what -- whether RJR's ever added levulinic acid or a chemical compound similar to it -- to any of its cigarettes as a -- as a flavor?
A. No. Not to my knowledge.
Q. Have you ever heard of a firm called -- I'll spell it: H-O-E-C-H-T (sic), dash, R-O-U-S-S-E-L?
A. Yes.

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Q. How do you pronounce the first word?

A. Hoechst-Roussel.

Q. You ever do any work with Hoechst-Roussel?

A. Very briefly.

Q. When was that?

A. Would have been around '89, '90, thereabouts.

Q. What was the nature of the work?

A. We were trying to get them interested in some of our nicotine receptor work, possibly to use some of our compounds or analogues as therapeutics.

Q. And why were you interested in getting them interested in that area?

A. Because, as we talked about earlier, we were becoming aware of the epidemiology related to certain diseases and how nicotine could be beneficial. And we went on to suppose that you could develop compounds similar to nicotine that would be therapeutically beneficial as well. But, of course, we didn't have the infrastructure or wherewithal to pursue that course, so we -- at that time we're talking to them about whether they'd be interested in taking it on.

Q. And that would be a view towards their commercially exploiting it at some point.

A. Well, from their viewpoint, I presume that's

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what they would be interested in.

Q. What was RJR's viewpoint, to see whether they could obtain some type of compensation or consideration for whatever input it could provide in that -- in that area?

A. I'm not sure what the impetus was of RJR; I mean, you can't speak for the company. I can only speak for my own scientific interests.

Q. What did Hoechst-Roussel do when it was -- well, they were approached by RJR?

A. Yes.

Q. Did you personally go to Germany to meet with them?

A. No, no, no. This wasn't in Germany, this was in New Jersey.

Q. Oh, okay. Does Hoechst-Roussel have offices in Germany, to your knowledge?

A. I -- I'm not -- I mean, I'm not aware. I'm sure they must, but --

Q. Okay. And did you go to their office in New Jersey?

A. Yes.

Q. On more than one occasion?

A. At least once. Maybe twice.

Q. Okay. Who accompanied you there?

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A. The others in the scientific team.

Q. How many were there?

A. Maybe five or six of us.

Q. Who were the people that you met with at Hoechst-Roussel?

A. Now I really have to dig back.

The names escape me now since it's been so many years. But I believe their -- their head of R & D was involved in those discussions.

Q. Do you recall his name?

A. It may have been Richard Allen, but I'm not sure.

Q. What was their response -- well, I'm sorry. Did you make a proposal to them?

A. Not really. We showed them the data, to see if there was anything there that was of interest to them.

Q. What data was that? What did the data relate to?

A. It related to the -- the work that we had been doing on the receptors and some of the effects of the different analogues.

Q. What was the response of Hoechst-Roussel?

A. They were interested in it. And --

Q. What happened? Was it pursued?

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A. They -- they took about six or eight of the compounds and did some work with them. But it turned out the compounds, at that time, were all known compounds. And so, from a business standpoint, they were not as excited as they would have been had they been novel compounds.
Q. Did they do any studies -- well, did they -- what did they do with the compounds, if you know?
A. Ran them through their standard discovery batter -- test batteries, in vitro, primarily.
Q. At that time -- let's see, it was RJR Nabisco, wasn't it? It wasn't just RJR?
A. Yes.
Q. Was there some reason why, with respect to this issue, you didn't look to see whether someone within RJR Nabisco would want to try to develop the -- the possible therapeutic use of -- that was being worked on -- wanted to develop the -- a product with respect to the studies that you were undertaking?
A. That one kind of -- could you shorten that one just a little bit.
Q. I'll rephrase it. I'm sorry.
Why, if you know, did you not try to have this developed within RJR Nabisco as opposed

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to going outside of RJR Nabisco?
A. My understanding that -- was that Nabisco was into foods and that they would not have the expertise or infrastructure to do that.
Q. Did Mr. -- Dr. Hayes know about the approach to Hoechst-Roussel?
A. Yes.
Q. Did you speak to him about it?
A. I'm sure at one point or other that I did, yes.
Q. Do you recall what you said to him or what he said to you about it?
A. Not specifically, no.
Q. Do you recall generally what the subject was of any communications you had with him?
A. Probably along the lines where I mentioned earlier. Just the fact that, you know, we have this technology; it could be some use outside of, you know, the therapeutic arena.
Q. And I think you said this, but the approach to Hoechst-Roussel was done in around 1990? Is that correct?
A. Fairly close to that time, yes.
Q. Did you approach any other companies trying to pursue this with them, outside of --

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A. Outside of Hoechst-Roussel?
Q. Yeah, other than Hoechst-Roussel.
A. No.
Q. Do you, per se, have an understanding of the term "addiction"?
A. I'm sorry?
Q. Do you personally have an understanding of the term "addiction"?
A. Only in a very general sense. I don't know the specific scientific nomenclature around it.
Q. What's your general understanding of "addiction"?
A. I can only think of it anecdotally, in terms of picturing something like heroine, where you have severe effects of a -- of a drug on -- on the human body: Intoxication, inability to -- to function properly. I always think of, you know, addictive drugs like that as being harmful to society, et cetera, et cetera. You know, those sorts of general views.
Q. Do you think cigarette smoking is harmful to society?
A. I believe that it's -- it's a freedom of choice that people have. And it may or may not be harmful, depending on whose viewpoint you ascribe

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to.

Q. Your viewpoint.

A. My viewpoint is that --

Q. In your viewpoint is it harmful to society?

A. -- that it's a risk factor for the people who choose to engage in that activity. I don't believe it's harmful to society, though. In fact, from everything I've seen in my nicotine work, if anything, there are beneficial effects to be derived, that most people aren't unaware of.

Q. Smoking cigarettes has beneficial impacts on the people who smoke?

A. To the extent that nicotine has beneficial effects, yes.

Q. All right. And what about to the extent that it has detrimental effects, like causing cancer?

A. Well, I don't ascribe to -- to that proposition; but, again, it's -- it is a risk factor, coupled with a lot of other risk factors that could potentially come together to do that.

Q. Are the bene -- what you viewed as the beneficial aspects of cigarette smoking, is that proven, to your view, beyond any doubt?

MS. FEE: Object to the form. I think that misstates his testimony.

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MR. PLASSE: You can answer.
THE WITNESS: Can you rephrase it?
I'm not sure exactly ...
BY MR. PLASSE:
Q. Well, I think you referred to, I'm not sure of the exact words, but there are certain positive or beneficial aspects of nicotine?
A. Yes.
Q. Okay. And, in your view, there are negative aspects of nicotine?
A. It depends on how you want to define "negative". We talked earlier about cardiovascular effects. If you view those as negative, then there are potential negative effects.
Q. Do you view those as negative?
A. I would say, in a normal, healthy human body, no. Because of the -- the size of those effects is relatively small.
Q. Okay. We had talked -- if you look at Exhibit 35. Under "Acute Effects," the first page.
A. Right.
Q. (Reading)
The overall result of this stimulation is an increase in heart rate, blood

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pressure, cardiac output, stroke volume, myocardial contractile velocity and force, coronary blood flow, myocardial oxygen consumption, arrhythmia induction, and electrocardiographic changes.

Do you view these as positive or negative results?

A. As I said, it depends on the context and on the person. I could see where those --

Q. Well, in any person at all are these positive results?

A. Yes. I would say in an elderly person, for example, who already has compromised cardiovasculature, it could become a bigger problem.

Q. Okay. So would you recommend to an older person that he smoke cigarettes?

A. If that older person was compromised physically in some way, probably not; at least with respect to these cardiovascular changes.

Q. Are there withdrawal effects from heroine?

A. I believe so, yes. Very severe withdrawal

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effects.

Q. Are there some withdrawal effects from not smoking cigarettes because of the -- well, are there withdrawal effects from not smoking cigarettes, to a smoker?

A. I'm not familiar completely with that area, but I've heard, yes, there are minor effects that occur.

Q. What are those minor effects that you've heard of?

A. Things like restlessness and inability to concentrate. Things like -- things along those lines.

Q. Did you ever hear anyone say that nicotine is addictive?

A. Yes, I have.

Q. Who has said that, if you recall?

A. The Surgeon General has made that statement.

Q. Was that in a report circulated sometime in late nineteen eighty -- well, I guess, in around 1988?

A. I don't remember the exact date, but, uh-huh --

Q. Is that while you were at RJR that that report came out?

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A. Yes.
Q. Did you have discussions at RJR about the Surgeon General's view that nicotine was addictive?
A. I did not personally have many conversations along those lines, no.
MR. PLASSE: Could I have his answer read back, please.
(WHEREUPON, THE ANSWER WAS READ BACK BY THE COURT REPORTER AS FOLLOWS:
I did not personally have many conversations along those lines, no.
MR. PLASSE: I'm sorry. What was my question?
(WHEREUPON, THE QUESTION WAS READ BACK BY THE COURT REPORTER AS FOLLOWS:
Did you have discussions at RJR --
MR. PLASSE: Fine. Okay.
BY MR. PLASSE:
Q. Did you have any discussions about that, the Surgeon General's report?
A. Yes. Of course.
Q. Who did you speak to about it? Do you recall?

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A. Typically, John Robinson and those people who were doing work in that area and knew the subject quite well.

Q. Did Mr. Robinson respond to -- well, what did Mr. Robinson say, if anything, in connection with the -- in reference to the Surgeon General's view that nicotine was addictive?

A. I can't recall specific things that he said. Probably the best thing to do would be to go to the reference that he and Dr. Pritchard produced on that subject.

Q. Where basically --

A. I just don't want to misquote.

Q. And is it your understanding that Dr. Robinson disagreed with the Surgeon General's view?

A. Yes.

Q. Okay. Do you disagree with the Surgeon General's view?

A. Yes. But cannot back it up to the extent that Dr. Robinson can, having the background that he does in that area. I view it more as a -- as a common sense issue.

Q. You personally didn't -- were not involved in any studies or research to determine whether

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nicotine was addictive or not, were you?
A. No.
Q. Was Dr. Robinson, that you know of, involved in any such researches -- research or study?
A. Not -- not to my knowledge, no.
Q. Was anyone at RJR involved in any research or study to determine whether nicotine was addictive?
A. No. Not that I -- I mean, not that I'm aware of.
Q. So when you heard about the Surgeon General's view that nicotine was addictive, were you skeptical about it?
A. Yes.
Q. Do you have an understanding of the term "dependency"? Used in the context of smoking.
A. Well, I -- I suppose people use it interchangeably with addiction.
Q. So do you have a view as to whether smoking creates a dependency?
A. I personally view it as what I would call habit-forming, potentially.
Q. Okay. Just turning back to dependency, do you have a view as to whether smoking creates a dependency?
A. I personally view dependency -- again, I

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don't know the specific scientific definition of dependency, but I view that word as implying something much stronger; more toward addiction and inability to -- to control the -- the action.
Q. So, is the answer yes or no? Do you think smoking creates a dependency?
A. I believe it is a free choice that people make. So I guess, no.
Q. So you don't think smoking creates dependency; is that correct?
A. Not the way I view the word "dependency".
Q. Okay. I mean, that's what I was asking.
A. Yes. Yes.
Q. Do you have any -- let's see -- to your knowledge, at R & D at RJR, were there -- was there testing conducted to determine levels of nicotine in -- in humans who've smoked?
A. I believe there was some testing done in that area, yes.
Q. Were you involved with that?
A. No.
Q. Who was?
A. I believe, primarily Dr. Robinson.
Q. Okay.
To your knowledge, was there any testing

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done on cigarettes -- not the FTC type testing, but on cigarettes -- I'm sorry, chemical testing on tobacco and cigarettes to determine levels of nicotine?

A. To determine the levels in products?

Q. Yeah, in the product?

A. We have an analytical group that does that sort of thing, yes.

Q. Who's involved -- is that part of R & D?

A. Yes.

Q. And who's involved -- would be -- who was involved with that?

A. It's a very large division. I think it has about --

Q. Is there a person in charge, supervisor?

A. Yes.

Q. Who is that?

A. Dr. Bob Lloyd.

Q. So he would know about chemical testing done on cigarette product to determine the level of nicotine in that product?

A. I believe he would.

Q. Is he still with RJR?

A. Yes.

Q. How long has he been with RJR?

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A. I'm not sure. He's been there quite a while, though.

Q. Did he precede you?

A. Yes.

MR. PLASSE: I have no further questions, thanks.

THE WITNESS: You're welcome.

VIDEOGRAPHER: This is the end of the deposition. We're going off the record at 2:12 p.m.

(SIGNATURE RESERVED)

(DEPOSITION CONCLUDED AT 2:12 P.M.)

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CERTIFICATE

I, Patrick M. Lippiello, Ph.D., do hereby certify that I have read and understand the foregoing transcript and believe it to be a true, accurate, and complete transcript of my testimony, subject to the attached list of changes, if any.

____
Patrick M. Lippiello, Ph.D.

This deposition was signed in my presence by _________________________, on the ______ day of _________________________, 1997.

Notary Public

My commission expires:

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ERRATA SHEET

RE: New York Tobacco litigation

DEPOSITION OF: Patrick M. Lippiello, Ph.D.

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STATE OF NORTH CAROLINA
COUNTY OF YADKIN

REPORTER'S CERTIFICATE

I, Linda N. Russell, a Notary Public in and for the State of North Carolina, do hereby certify that there came before me on Friday, October 17, 1997, the person hereinbefore named, who was by me duly sworn to testify to the truth and nothing but the truth of his knowledge concerning the matters in controversy in this cause; that the witness was thereupon examined under oath, the examination reduced to typewriting under my direction, and the deposition is a true record of the testimony given by the witness.

I further certify that I am neither attorney or counsel for, nor related to or employed by, any attorney or counsel employed by the parties hereto or financially interested in the action.

IN WITNESS WHEREOF, I have hereto set my hand and affixed my official notarial seal, this the 27th day of October 1997.

Linda N. Russell

Linda N. Russell, Notary Public
My Commission Expires 9/3/02

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